S. HRG. 103-233, Pt. 1

TAKING STOCK OF ENVIRONMENTAL PROBLEMS

Y 4.P 96/10:S.HRG.103-
233/PT.1
Taking Stock of Environmental Probl...

HEARINGS

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

MARCH 24, 31, AND JULY 16, 1993

PART 1

Printed for the use of the Committee on Environment and Public Works

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FOREWORD BY SENATOR MAX BAUCUS

Last winter, when I became Chairman of the Committee on Environment and Public Works, I looked over the agenda for the 103rd Congress. The Committee had many significant environmental issues to address—the Clean Water Act; the Endangered Species Act; the Safe Drinking Water Act; oversight of the Clean Air Act Amendments of 1990. But I decided that before becoming too deeply involved in particular issues or legislation, the Committee should first step back and look at the big canvas. To do this, I convened a series of three hearings to "take stock" of our environmental problems. The purpose of the hearings was to permit the Committee to reflect on the accomplishments and on the shortcomings of our current laws, thereby helping us to set priorities for future action. What follows are the proceedings of the Taking Stock hearings.

In testimony before the Committee in 1992, one of its most distinguished alumni, Senator Edmund Muskie, stated that environmental problems facing us today are "more complex, subtle, and politically challenging" than the problems he and the Environment Committee faced a generation ago. These Taking Stock hearings provided an ample supply of illustrations for Senator Muskie's conclusions. The Committee heard testimony from scientific experts, representatives of environmental groups, legal scholars, economists, doctors and State regulators. And despite the differences in their outlooks and approaches, they all agreed with Senator Muskie's assessment.

Today's environmental problems are extraordinarily complex. We are beginning to recognize that we are exposed to many chemicals from many sources at all stages of our lives. Our ability to understand how those chemicals relate to each other within the body or even within an ecosystem is at best imperfect. However, according to Dr. Devra Davis of the National Research Council, more and better science will not provide easy answers to these environmental problems. Scientists will never be able to set priorities—that is the role of government and policymakers. On the other hand, Whitney Tilt, of the National Fish and Wildlife Association, pointed out that policymakers cannot set priorities well right now because the public's environmental literacy is low. So sometimes fear and misinformation drive decisions regarding environmental priorities.

At the same time, environmental problems are also subtle. Take, for example, the loss of species. We do not know how many species of plant and animal life exist on this planet, and a complete inventory of them is a Herculean task. Moreover, the endangered number may seem relatively small when compared to the estimates of the total number of species, leading some to argue that there really is no problem at all. But, according to Dr. Thomas Lovejoy of

the Smithsonian Institution, the loss of our biodiversity is a "huge problem and it dwarfs everything else in the world." The ripple effects of the loss of each species are far greater than we can sense. Similarly, we have done great research into the carcinogenicity of many toxic chemicals, but that is only part of the story. Dr. Theo Colborn of the World Wildlife Fund told the Committee that the less obvious, but devastating non-cancer health effects of chemicals, such as birth defects, have been largely overlooked.

Finally, these problems present extraordinary political challenges for those of us taking part in the debate. The most obvious of these challenges is the fact that environmental problems do not contain themselves within State or national boundaries. Regional and international solutions must be sought even when governmental structures do not exist or are only in their infancy. Here at home, many States have become more than just junior partners in implementing our environmental laws. But Thomas Jorling, the Commissioner of New York's Department of Environmental Conservation, pointed out an alarming phenomenon in the relationship between and among States. States that are not performing well in terms of implementing their State programs are reaping an economic benefit at the expense of their progressive neighbors. He described it as environmental "cannibalism" rooted in the competition for economic activity, and this competition is mirrored on the international level among nations. This sort of economic competition which jeopardizes the environment is exactly what the founders of our environmental laws sought to avoid.

But the political problems involve more than just geography; they involve race and resources as well. Deeohn Ferris of the Lawyers Committee for Civil Rights Under Law correctly pointed out that people of color and people with low incomes are most often the reluctant neighbors of "hazardous waste sites, incinerators, industrial production facilities, pesticide and radiation exposures." Lack of resources at every level also hinders further progress. Tom Udall of the National Association of Attorneys General stated that good enforcement at the State level, which is one way to ensure that there are not disproportionate impacts on poor and minority communities, is often made difficult because there are not sufficient Federal funds made available to States.

In order to be able to solve these complex, subtle and politically challenging problems, I am convinced, after listening to the testimony contained in this volume, that we must drastically alter the way we think about environmental policy. We must prioritize our environmental problems better. Given limited resources, we have no choice but to solve our most significant environmental problems first. In addition, we must keep the public involved, because we can only enact legislation that addresses priority issues if there is a public consensus in favor of doing so. Finally, we need to look at integrated solutions to environmental pollution rather than approaching it one medium at a time. We cannot simply divide and conquer each environmental problem as if air and water and soil are not intrinsically related. The notion of an integrated system of environmental standards and enforcement is a dramatic change from the current system, but, according to the experts who testified

before the Committee, it is gaining strength due to its inherent sensibility.

At this point, our task of taking stock has only just begun. Therefore, the Committee intends to hold a second series of Taking Stock hearings to explore three areas that may hold the key to solving the environmental problems we face today: integrated pollution prevention and control; environmental education; and the use of economic incentives to encourage environmentally beneficial behavior. These subjects have not been fully explored by the Committee and are critical to discovering how to achieve the next step of environmental progress.

As a final note, despite the challenges described during the course of the hearings, I am more optimistic about the prospects for achieving environmental progress than any time in the last decade. These hearings demonstrated to me that there has been a basic change in government philosophy and in public attitudes toward environmental protection. We are leaving an era too often marked by reaction, backlash and fear; we are entering one of greater hope and change. We seem to be resolving a bitter and destructive argument that has hindered environmental progress for decades. That, of course, is the contention by some that environmental protection will destroy jobs and end economic growth; and the contention by others that a vigorous economy and technological advances will destroy the environment.

I believe that we are on the verge of a Renaissance—a rebirth of environmental policy. At the core of this Renaissance, as at the core of the Renaissance in Europe hundreds of years ago, is better understanding. It is the understanding that we must preserve our natural resources to sustain ourselves both economically and physically. Industrial and environmental groups are beginning to find common ground in the goal of sustainable development—a growing economy, secure jobs, a healthy and clean environment. The challenge is no longer *whether*, but *how* to reach the goal.

HEARING TESTIMONY HIGHLIGHTS

Senator Baucus.—"Last year the Committee heard from one of our most distinguished alumni, Senator Edmund Muskie. He told us that the environmental problems facing us today are 'more complex, subtle, and politically challenging,' than the problems he and this Committee faced a generation ago." (P. 1.)

Senator Baucus.—"To a policymaker, science has an unnerving habit of often being able to give only incomplete or preliminary information. Yet potential consequences of action or inaction may be sufficiently serious that a decision must be made, even in the face of incomplete information. How then should we fashion a public policy that balances the uncertainties with the stakes involved?" (P. 5.)

Thomas Lovejoy.—"Biological diversity really integrates all kinds of environmental problems, or at least most of them. Sometimes the first sign of any problem is in some other species than ourselves. If you look at a problem worldwide, as you know, tropical forests are going at something on the order of 100 acres a minute and that drives the estimation of extinction rates being 1,000 to 10,000 times normal. It is a huge problem and it dwarfs everything else in the world." (P. 7.)

Theo Colborn.—"By focusing our limited public health resources on cancer, we have overlooked serious noncancer health effects. When we combine this with arrogance on the part of the chemical industry, reluctance on the part of the agencies to accept and act upon evidence of damage, and our lack of knowledge about the less obvious but devastating health effects of chemicals, it is easy to see how we got in this predicament." (P. 10.)

Deeohn Ferris.—"The concept of environmental justice has emerged from the growing recognition that people of color and people with low incomes more often live and work in areas in the United States where environmental risks are high. People of color and people with low incomes are most often the unwilling recipients of hazardous waste sites, incinerators, industrial production facilities, pesticide and radiation exposure." (P. 11.)

Dr. Devra Davis.—"Better science is being held up somewhat like a cross to a vampire as the thing that will solve the problems, transfix our environmental dilemmas and stave off economic ruin and devastation." (P. 18.)

Senator Baucus.—"To some States and local governments, the Federal Government has become a helping hand with no grip, while to others it wields an indiscriminant hammer." (P. 126.)

Senator Kempthorne.—"When science runs counter to desired results, some advocated recommend recourse to so-called 'higher values.' How do you guard against politicized science? And how (do)

we develop a new science so that it becomes a tool for consensus and not a means to divide and entrench us in our positions?" (P. 132.)

Thomas Jorling.—"Many of the statutes and many of the early patterns of Federal-State relationships were established on the premise that States were junior partners, they weren't fully competent, and they weren't fully staffed or organized to deal with these ambitious programs. That has changed." (P. 138.)

Whitney Tilt.—"Today, Mr. Chairman, our [environmental] education efforts are not unlike the prairie potholes of the eastern part of your State. They are isolated, small, fragmented, and very susceptible to outside interference." (P. 141.)

David Jordan.—"As former EPA Administrator William Ruckelshaus once noted, the public does not distinguish among levels of government. If any one of us fails in meeting our obligations, we will all be held accountable." (P. 143.)

Senator Chaffee.—"Industry is no longer the principal source of complaints about Federal environmental law. Government officials, State and local elected officials, are now the source of the loudest and most numerous complaints. We need to repair these relationships. We need to restore the foundation of mutual respect that must be present if these statutes are to work." (P. 147.)

Thomas Jorling.—"I have argued many times that the reason we cannot get an advanced technology to remediate a site—for instance, bring a temporary thermal combuster in to remove organic contamination . . . is because so few of our citizens are now taking chemistry and physics. . . . So when you say 'combustion and incineration,' stark visions appear in their minds about some vile outcome." (P. 151.)

Russell Train.—"Sustainable development is not so much a quantifiabie objective as a strategy for improving the quality of life while preserving environmental integrity. It means living off nature's interest, not running through its capital. Sustainable development means leaving future generations at least as many options as we enjoy." (P. 204.)

William Ruckelshaus.—"The Administrator of EPA must follow rules of nine major statutes, none of which were designed to work with one another. There is no integrating principle built at all into this statutory armory. Each is written to stand alone, as if the world were made entirely of air or water or some other target of concern. No word in all this law directs EPA to simply find the combination of policies across all programs that will garner the maximum benefit to the environment for every dollar of cost expended." (P. 207.)

William Ruckelshaus.—"Running through the strata of statutes like a vein of ore, written into the language and the intent of the law, is the assumption that EPA cannot be trusted with discretion. The environmental statutes of the United States exhibit a degree of rigor and specificity, all enforceable by the courts, unknown in other nations or, indeed, in any other branch of Federal law." (P. 208.)

William Ruckelshaus.—"We have to face the fact that Americans love both the environment and the most polluting lifestyle on earth." (P. 209.)

David Buzzelli.—"In the early days of RCRA, inspectors used to come out and look at what we were doing. Now they come and look at the records we have. They're not looking at what we're doing any more, and I think that's a challenge for us." (P. 223.)

David Buzzelli.—"I think simply this Committee continuing to ask people to come before it and to think about what we can do differently than we're doing today—that's not something that happens in a congressional committee because that forces long term thinking. . . . What would you do differently? Most people don't think about that very often; they usually think about what's wrong with today. I think that the process you are conducting today, and which I hope you will continue to conduct, will force people to come forward with better ideas." (P. 239.)

TAKING STOCK OF ENVIRONMENTAL PROBLEMS

WEDNESDAY, MARCH 24, 1993

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

ASSESSING ENVIRONMENTAL THREATS

The committee met, pursuant to notice, at 10:10 a.m. in room SD-406, Dirksen Senate Office Building, Hon. Max Baucus [chairman of the committee] presiding.

Present: Senators Baucus, Chafee, Reid, Boxer, Kempthorne, and Faircloth.

OPENING STATEMENT OF HON. MAX BAUCUS, U.S. SENATOR FROM THE STATE OF MONTANA

Senator BAUCUS. The hearing will come to order.

I first want to inform all who are interested that many members of this committee are also members of the Senate Finance Committee. This committee was scheduled to begin its hearing at 10 o'clock and the Senate Finance Committee was scheduled to commence its hearing at 10 o'clock. The primary witness before the Finance Committee is Chairman Greenspan, and I'm sure many members of the Finance Committee would like to ask him questions. So I expect that several members of that committee who are also members of this committee will arrive a little bit later.

I want to welcome our witnesses to the first of three hearings in which we will take stock of environmental problems. These hearings are designed to let us reflect on the accomplishments and on the shortcomings of our current laws, thereby helping us to set priorities for future action.

This committee has jurisdiction over most of our major environmental laws and, periodically, we review them for their effectiveness in achieving the goals of cleaner air, cleaner water, and the like. That will be the case this year with the Clean Water Act, the Superfund law, and the Endangered Species Act. Before we jump into the specific issues involved in these bills, I believe it is important to take a step back and ask a few broader questions; questions related not to just specific statutes, but to our overall environmental goals.

Last year, the committee heard from one of its most distinguished alumni, Senator Ed Muskie. He told us that the environmental problems facing us today are "more complex, subtle, and

politically challenging," than the problems he and this committee faced a generation ago.

Part of the complexity comes from the growing interrelationship among the media. Tighter controls on airborne releases of some chemicals, for instance, may lead to greater releases into the water or the soil and so it is with hazardous waste cleanup and other activities. Yet, we are not at the point today where we can replace the Clean Air Act and the Clean Water Act, and all the other statutes with one, comprehensive, clean environment act. So we need to find a better way of incorporating these multimedia concerns into existing laws.

Likewise, we have to recognize that we are all exposed, not just to one chemical at a time, but to many chemicals, and at all stages of our life. Yet, our ability to understand how these chemicals relate to each other within the body or within the ecosystem is at best imperfect. So we have yet another of Senator Muskie's complex, subtle, and challenging problems.

Tackling these problems is made even more challenging by our seeming preoccupation with fighting each other, perpetuating the religious wars that dominated many environmental debates which distract us from the real job at hand.

Some of you have heard me give this speech before but I really believe it is one of the reasons our progress to date has not been better. The Cold War is over, and I would hope that we can also bring an end to the religious wars on the environment.

The purpose of the hearing today is to assess our current efforts to protect human and ecological health. I think this is particularly appropriate at the beginning of a new administration, one which shares a deep commitment to environmental protection. I know the new EPA Administrator shares some of my concerns about the future course of environmental protection and I hope that working with her and the members of this committee will enable us to achieve great progress.

The topic for this hearing is also appropriate as the country begins an extensive revision of its health care system. There are clear links between environmental exposures to certain compounds and human health as we will hear from our panel, but there also are environmental components of our health care delivery system and health care reform efforts must take this into account.

There are two issues I would like to explore in greater detail with the panel. First, how can we better assess the risks to public and ecological health? We have spent a lot of money reducing pollution in the Clean Water Act, the Clean Air Act and Superfund, but very little of it determining the effects of such reductions. Without these kinds of data, we have no way of measuring our progress in protecting humans and other species that inhabit this earth. Furthermore, without these data, we cannot intelligently set priorities.

Second, how can we better evaluate when we know enough to act? To a policymaker, science has an unnerving habit of often being able to give only incomplete or preliminary information. Yet potential consequences of action or inaction may be sufficiently serious that a decision must be made, even in the face of incomplete

information. How then should we fashion a public policy that balances the uncertainties with the stakes involved?

That is especially true for the so-called involuntary risks associated with environmental pollution. Unlike such major health risks as smoking or inadequate diet, exposures to environmental contamination usually cannot be avoided. You cannot choose not to breathe the air, even if it is unhealthy. So should we favor safety and prudence more than we might other voluntary endeavors.

I must say, as I review these issues that Senator Muskie is seeming more prescient all the time. These are some of the concerns that this committee faces across the breadth of our environmental laws and I hope the witnesses today will be able to shed some light on these questions and give us a little guidance as we begin our legislative tasks.

Now I'd like to turn to the ranking member of the committee, Senator Chafee.

OPENING STATEMENT OF HON. JOHN H. CHAFEE, U.S. SENATOR FROM THE STATE OF RHODE ISLAND

Senator CHAFEE. Thank you very much, Mr. Chairman.

I apologize; because I'm involved with another hearing I can't stay very long but I'm glad you're having this hearing and I will review the record.

Mr. Chairman, we can't always wait for scientific evidence to be finalized before we act. Sometimes it turns out that we should have pursued a matter further or that what we did was too much. Take the case of dioxin. Maybe it turns out that dioxin isn't as toxic to humans as we originally thought and we went too far. On the other hand, it turns out that lead is more serious than we previously thought and we ought to do more. You're not going to find us able to wait until every bit of scientific evidence comes in before we move.

Also, there are other factors. It isn't always science that makes for action. Let me give you an illustration. Medical waste; it wasn't the health risk from medical waste and syringes washing up on beaches that caused us to take action in 1988, it was the disgust factor. The public didn't want syringes on the beaches. They are not interested that there's very little scientific chance they're going to step on a syringe and get AIDS. They don't care about that; they don't want the syringes there period, and you can't blame them. On the basis of that, we undertook action that I suppose on a cost benefit ratio was expensive, but it was in answer to what you might call values.

So, Mr. Chairman, I look forward to hearing what I can of the testimony. I'll be reviewing it. This has been covered to some degree in those *New York Times* articles we've recently seen.

Thank you.

Senator BAUCUS. Thank you very much, Senator.

Senator CHAFEE. I have a statement I'd like to put in the record.

Senator BAUCUS. Without objection.

[Senator Chafee's statement follows:]

OPENNING STATEMENT OF HON. JOHN H. CHAFEE, U.S. SENATOR FROM THE STATE OF RHODE ISLAND

Mr. Chairman, this is a very timely hearing. I am sure that everybody here today has been following the series of articles appearing this week in the *New York Times.*

The articles are based on case studies covering topics as diverse as acid rain, ocean dumping and cyclamates. The common thread the reporters find in these cases is new scientific information that calls into question decisions that Congress made on scientific information that it had previously received. The impression left with the reader is one of great confusion and an absence any rational underpinning for the environmental policies now in place.

The articles appearing on Tuesday addressed the subject of animal testing and its role in regulating agents that may cause cancer. It is certainly a leap to go from animal data to predict effects in humans. There is uncertainty and the *Times* makes much of the uncertainty. But we know a great deal about cancer compared to our knowledge of other human health effects like birth defects or developmental problems. And the gaps in our knowledge on the adverse ecological effects of some of these pollutants is even larger.

The information that comes to Congress, scientific and otherwise, is and always had been mixed. There are some who continually expect that science can give us pat answers for all our difficult questions. This is true not just on environmental issues, but in all areas of public policy. People want government decisions built on bedrock that doesn't shift over time.

But the information coming to the Congress rarely makes a picture that is solid and immutable. And when the stakes are high, hen the adverse effect is very serious, it may be prudent to act before all the data is in, to take protective measures even if we overshoot the target a bit. This is called the precautionary principle. It has an important role to play in environmental policy.

Sometimes we can be pleasantly surprised by new science. Maybe it will turn out that dioxin is not so toxic to humans as we originally thought. But just as often, new scientific evidence will cause us to tighten standards as we are now in the process of doing for lead. New information may push us in either directional

Science is also not the only foundation for environmental policy. Take the case of medical wastes. It wasn't so much the health risk from medical waste that drove the legislative process in 1988. It was the disgust factor. The public doesn't want used syringes and bandages on the beach. On that basis alone it was proper to respond to the medical waste problem in 1988.

When I try to grapple with the confusing picture the *Times* is now portraying, the story isn't that a new scientific study contradicted an old study. That happens all the time The real story here is that our world, and our bodies, are being invaded by a flood of new synthetic materials the effects of which we only barely understand.

compared to the effort this society makes to invent, develop, manufacture and sell these new materials, the amount we spend understanding their health and environmental effects is small. That's the story.

Senator BAUCUS. Senator Reid?

OPENING STATEMENT OF HON. HARRY REID, U.S. SENATOR FROM THE STATE OF NEVADA

Senator REID. Mr. Chairman, thank you very much.

Like Senator Chafee, this is very difficult for me. I'm not going to be able to attend very much of this hearing and I'm sorry that I can't. This is a great panel of witnesses. I am chairman, as some of you know, of the Subcommittee on Toxic Substances and we spend a great deal of time working on things that I'd like to ask you questions about, such as composite materials, pesticides, fungicides, the food that we eat, lawn chemicals, and, of course, lead. We were able to put a few things in the housing bill last year regarding lead which was a step in the right direction.

Dr. Lovejoy, it's good to see you here. The good work that you've done with the Smithsonian is important. Mr. Moore, it's important that you bring to this committee your knowledge about lead poisoning. As I've indicated, this is something that's of great interest to

me. I'm going to introduce a bill next week to try to complete the work that we haven't been able to complete. In the past, we've had objections from the lead sinker people and it's been so enlightening to me. Can you imagine, there is tons of lead used each year for lead sinkers. We really have to take a look at how we operate.

Dr. Davis, your comments this morning on Fox News regarding this being such a serious children's problem, I may be misstating it but I think I heard you say that it was the most serious problem facing children in America today and I've said that myself. Because of my total lack of scientific background, people don't believe me. While it may not be the most serious problem, there may be some dispute as to which is number one and which is number two, but it is certainly up at the top. You're bringing that to the attention of thousands and thousands of people, maybe millions, that watch the news certainly indicates that.

Mr. Chairman, let me just say this. The things we do here in Washington, people think we do in a vacuum, that we never have any personal experience, that all these things are in a memo that staff gives us. My interest in lead began at a hearing, after which I realized that my only daughter, pregnant at the time, had just bought a 52-year-old home here in the Washington area. So after the meeting I quickly called her and her husband and said, move in with us, while you have your home made lead-free. They did. Lana is one of the fortunate ones because she had some place that she could go. Some people don't have that luxury.

These things we talk about here, like lead poisoning, are real things. They affect us and our families and the millions and millions of people who are exposed to this every day. I also am convinced that what you said this morning is right, we have to start doing what's important—child care centers, schools. We know that lead in schools, specially the elementary schools, is very, very bad. We should do something about that. Child care centers, we should have a program to make sure that when a parent takes their child to a child care center, they are not going to be lead poisoned.

I look forward to this hearing. I have staff here and I'm going to try to get back as soon as I can, but Mr. Chairman, you are really to be commended. This hearing, in addition to those we've had earlier in the year, are just tremendous. I want to be as supportive as I can because you are certainly showing great leadership with the witnesses that come before us.

I hope you and Senator Chafee, will continue to give us the benefit of your experience and continue to make this committee the most effective committee in the Congress.

Senator BAUCUS. Thank you very much, Senator.

I'd like to now begin with our panel. The panel includes Dr. Thomas Lovejoy, Secretary, External Affairs, Smithsonian Institution; Dr. Theo Colborn, Senior Fellow, World Wildlife Fund in Washington, D.C.; Deeohn Ferris, Esquire, Project Director, Environmental Justice Project, Lawyer's Committee for Civil Rights Under Law here in Washington; Dr. David Rall, former Director, National Institute of Environmental Health Sciences, Founder and Former Director, National Toxicology Program in Washington; Dr. John A. Moore, President, Institute for Evaluating Health Risks; and Dr. Devra Davis, Scholar in Residence, Committee on Environ-

mental Epidemiology, National Research Council in Washington, D.C.

Let's begin in the order which I indicated. I see that another very able Member of this committee, Senator Boxer, has arrived. Senator Boxer, do you have a statement you'd like to make?

OPENING STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator BOXER. Thank you, Mr. Chairman.

I would just ask that my statement be placed in the record. I look forward to the hearing.

Senator BAUCUS. Without objection.

[Senator Boxer's statement follows:]

OPENING STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Mr. Chairman, I am glad you scheduled this hearing. We need to take time to assess the direction of our efforts to control pollution and minimize the associated environmental and human health impacts. I think it is a good time to assess whether we are doing the right thing when it comes to studying and controlling pollution.

Distinguished members of the panel, thank you for being here today. I know that many of you have spent the better part of your careers trying to assess the impacts of pollution on human health and the environment. I commend you all for your commitment in this endeavor and your presence here today to enlighten us on the very complex relationship between pollution and its impact on the environment and human health.

It is clear that we must focus our attention on the real threats to our environmental and public health and resist the temptation to look for easy political solutions. But we must also resist the dangerous temptation to delay taking action in the name of assuring absolute scientific certainty. We must always bear in mind that the impacts of pollution will be passed on to our children, both directly and indirectly. Directly, as in the case of mothers who ate dioxin contaminated fish from the Great Lakes. These children may never meet their full human potential as a result of the damage caused by the contaminated fish. Indirectly, in the environmental degradation resulting from waste that is improperly disposed of; waste that our children will be forced to clean up.

Mr. Chairman, as we consider these issues, I believe we must also account for the fact that minority communities are suffering disproportionately from the effects of pollution. This clearly seems to be the case with the siting of hazardous waste landfills and childhood exposure to lead.

In 1983, GAO found that hazardous waste landfills were more likely to be located in predominately African-American communities than white communities. This finding was confirmed by independent investigators in 1987 and 1990. In 1988, the U.S. Public Health Service reported that children in African-American families are twice as likely to have high blood-lead levels than children from white families with similar incomes.

These statistics are deeply troubling. We though by removing lead from gasoline that we would reduce the negative health effects of lead exposure to children. We need to ask ourselves if we have failed to deal with pollution problems on an equitable basis for the benefit of all our citizens.

I look forward to hearing the testimony of the panel today, Mr. Chairman. I hope that the distinguished scientists gathered here an shed some light on these questions—and help guide our deliberations to re-authorized Superfund, the Clean Water Act and other legislation the committee will take up this session.

Senator BAUCUS. I want to say to the witnesses that your complete statements will be included in the record and I'd ask each of you to summarize your testimony for 5 or 6 minutes. Then we will take it from there.

I'll begin with you, Dr. Lovejoy.

STATEMENT OF THOMAS E. LOVEJOY, ASSISTANT SECRETARY, EXTERNAL AFFAIRS, SMITHSONIAN INSTITUTION

Mr. LOVEJOY. Thank you, Mr. Chairman, for the opportunity to testify about trends in biological diversity worldwide and nationally. I just might note that although in the written testimony, there is very generous use of the first person plural, I'm really here as an individual expert and that such use was meant to reflect the state of knowledge within the science involved.

Let me just touch very rapidly on a couple of examples about the importance of biological diversity, one, the kind of public services that are provided.

When there was a healthy population of oysters in the Chesapeake Bay, it managed to filter a volume equal to the entire Bay once a week. That was for free.

Senator REID. Would you repeat that?

Mr. LOVEJOY. The oyster population of the Chesapeake Bay before it crashed filtered a volume equal to the entire Bay once a week.

Senator REID. I thought that was what you said.

Mr. LOVEJOY. It now does it once a year. That's just the power of a single species in providing a free, ecological service.

A second example is the kind of resources we are now able to extract at the level of the molecule from nature which emanates from a bacterium in a Yellowstone hotspring which runs a reaction called the polymerase chain reaction which is now a mainstay of modern diagnostic medicine. So when you go to the doctor and get a quick diagnosis of a sore throat instead of waiting two or three days, it's because of the molecule from that bacterium. This literally is driving economic activity on the order of billions of dollars a year.

More importantly, what is happening to this set of biological resources? Biological diversity really integrates all kinds of environmental problems, or at least most of them. Sometimes the first sign of any problem is in some other species other than ourselves.

If you look at the problem worldwide, as you know, tropical forests are going at something on the order of 100 acres a minute and that drives the estimation of extinction rates being 1,000 to 10,000 times normal. It is a huge problem and it dwarfs everything else in the world.

Nonetheless, it is important to think about the problem here in the 50 United States. One out of ten mollusks species are endangered; one-third of all fresh water fish species are endangered or threatened. One can just simply add numbers to the list.

Some years ago, a school boy in Ohio in 1960 did what kids often do and he made a butterfly collection in his home county of Seneca County. That turns out to be a very important set of information because there had been a count of butterfly species in that county in 1880. There were 82 species then. When Jim Porter, this young boy did this exhaustive job as only a kid can do, in 1960, he found 20 fewer species, namely 62. A later count in 1989 showed 48.

I use this example for two reasons. One, it illustrates a trend that occurs in many groups of organisms in many parts of the United States of loss of species at least locally if not to the point of

extinction. Second, I cite it because we still depend on sort of lucky accidents like a childhood butterfly collection for some of the data upon which we are basing our management and conservation action.

I do not mean to detract in any way from a lot of the work that goes on in the Fish and Wildlife Service with geographic information systems, State surveys, the Nature Conservancy or whatever, but anyone who looks realistically at these numbers knows that we still have a patchwork of information. Really the bottom line here is we need to improve our collection of information, the way we organize it, analyze it, and the way we transform it into resource management and action.

Thank you very much.

Senator BAUCUS. Thank you very much, Tom.

Next is Dr. Colborn.

STATEMENT OF THEO COLBORN, SENIOR FELLOW, WORLD WILDLIFE FUND

Mr. COLBORN. Thank you.

I am Dr. Theo Colborn, a Senior Fellow at the W. Walton Jones Foundation, presently on sabbatical at the World Wildlife Fund where I coordinate the Toxics and Wildlife Program.

I'm especially grateful for this opportunity to speak to you today because of what I just heard you say, but also because it is important that you understand a very serious and largely unexplored environmental health problem.

In brief, I, and many of my colleagues, estimate with confidence that exposure to manmade chemicals has damaging effects on the endocrine, the immune and the nervous systems of wildlife and humans, not principally in the generation exposed to the chemicals but in that generation's offspring. Since time is short, I have selected three broad points that I want to make to you and then ask that my more complete statement be inserted in the hearing record along with the first chapter of a recent book which I edited entitled, "Chemically Induced Alterations and Sexual and Functional Development, the Wildlife-Human Connection."

First, we have been missing the insidious health effects of manmade chemicals, effects that are not expressed as obvious birth defects or cancer. Seven years ago, I began compiling an extensive database on the health of wildlife and humans in relation to their exposure to these chemicals and discovered that many of the manmade chemicals have invaded the body, and in the case of a pregnant animal, entered her womb and changed the course of development of her baby.

We now have evidence from wildlife, laboratory animals, and the human experience that chemicals of this nature can alter the construction of the developing endocrine, immune and nervous systems of embryos, fetuses and breast-feeding offspring. Most often these effects are not expressed as obvious birth defects and that's why we have missed them, but more often in terms of loss of function in these systems so that the individual does not reach its fullest potential.

We missed the insidious nature of these chemicals, first of all, because the effects are not realized in the exposed adult, the mother, but in her offspring. Oftentimes, the full manifestation of the effects are not realized until the offspring reaches adulthood, for example, when suffering from the loss of fertility. Our testing protocols were not designed to catch the results of this insidious invasion of the body.

Let me give you three examples of what I mean. The first involves birds. Male herring gull chicks from the Great Lakes and the West Coast have been found with female sex organs, ovaries and oviducts, and the female chicks with extra oviductal tissue. Similar conditions were induced in the laboratory by feeding female sparrow hawks a DDT substitute, Dicofol. When the males grew up, they were reproductively incompetent and behaviorally submissive as well.

The second involves laboratory rats—and I hope Senator Chafee will listen to this one. This answers your questions about dioxin. If you expose a pregnant rat to only one meal of dioxin on day 15 of her pregnancy, her male pups become demasculinized and feminized and not all of the effects are measurable until the rats reach adulthood when a reduction in sperm count is only one indication of the problem. This is something we have to think about, the reproductive effects of dioxin, which we haven't considered in the past when assessing the risks of dioxin.

The third involves humans. A sample of babies born of women who ate two to three meals a month of Lake Michigan fish for at least six years preceding their pregnancy gave birth to babies that were lighter in weight, had smaller crania, and experienced shorter gestation than babies born in the same communities of mothers who did not eat fish. These children had cognitive, motor and behavioral deficits at birth and exhibited short-term memory problems at age four, as well as still remaining smaller in stature than their counterparts. They had not caught up in weight and height by that time.

While these examples might appear on the surface to be very different, they are all driven by a combination of three factors—the exquisite sensitivity of developing organisms to chemical signals; the reality that many manmade compounds are capable of disrupting those signals; and the unfortunate truth, that we have spread these biologically active chemicals throughout the environment either by design, ignorance or negligence.

My second point is that we need to take these effects as seriously, if not more seriously, than cancer. Almost two years ago, I convened 21 experts to focus on the problems of maternal transfer of toxic chemicals to the offspring. They were to reach some consensus about its nature and importance.

The results of their thinking and conclusions have now been published in this book which I'm going to leave with you today, and I have another for Senator Chafee if he would like one. I want to quote from that book because these scientists stated with certainty that "A large number of manmade chemicals have been released into the environment that have the potential to disrupt the endocrine systems of animals, including humans." They also proceeded to estimate with confidence that "Some of the developmental im-

pairments reported in humans today are seen in adult offspring of parents exposed to synthetic hormone disrupters released in the environment. Unless the environmental load of these chemicals is abated and controlled, large scale dysfunction at the population level is possible." I'd like to repeat that, "Large scale dysfunction at the population level is possible."

Since that meeting, a great deal of new evidence has been generated to support the above statements. In light of what we know today, I plead with you to consider seriously the importance of addressing these noncancer generational health effects in every aspect of legislation that you mentioned earlier that your committee intends to address.

As for my third point, our regulatory system is not geared to cope with chemicals of this nature. Most important, upon a close look at many chemicals freely released into the environment, one finds that we have done a good job about screening them for their acute toxicity, their tendency to cause mutations and cancer, and their obvious severe effects on the nervous system.

Our concern about cancer and gross-birth defects has kept a lot of bad chemicals off the market and restricted the use of others which we had become dependent upon. On one hand, we have to be thankful for our concern over cancer; it has prevented exposure to many chemicals. On the other hand, it has gotten us into a real pickle. By focusing our limited public health resources on cancer, we have overlooked serious noncancer health effects. When we combine this with arrogance on the part of the chemical industry, reluctance on the part of agencies to accept and act upon evidence of damage, and our lack of knowledge about the less obvious but devastating noncancer health effects of chemicals, it is easy to see how we got into this predicament.

We cannot let this continue if we are going to be able to cope with new products that, in some cases, are deliberately more potent so that less can be used. We are short on successes because we have an appalling history of failing to take the appropriate action when evidence of damage is presented. We have regulated too late, and in the case of DDT and others, for the wrong reason. In many cases, the chemical industry has taken advantage of the fact that under current laws, the chemical must be shown to cause harm, leaving the responsibility to the Federal agencies or the victims to prove damage.

On that, I will close and I hope you will read the following part of my statement that answers your three questions directly.

Thank you.

Senator BAUCUS. Thank you very, very much, Doctor.

Senator CHAFEE. Unfortunately, I have to go. Dr. Colborn offered to give me a book, did she?

Mr. COLBORN. Yes.

Senator CHAFEE. I accept. I also want to say, Dr. Colborn, you're with the Alton Jones Foundation, are you not?

Mr. COLBORN. That's right.

Senator CHAFEE. The Alton Jones Foundation very generously gave our State a very substantial piece of land which is preserved in wildlife. We are grateful to Mr. Jones. He used to come up there

and fish in that particular area. So we have a tie in Rhode Island to Alton Jones.

Mr. COLBORN. You can be thankful for the W. Alton Jones Foundation for giving me the privilege to spend the time to bring all this information together and synthesize it. There isn't an agency that can afford to do this, there isn't a person in academia who has the time to do it. This was something that was Foundation-driven and I want to point that out. We need to think about this more in our planning about environmental activities in our Nation.

Senator CHAFEE. Three cheers for the Alton Jones Foundation.

Mr. COLBORN. Thank you.

Senator BAUCUS. Next is Deeohn Ferris.

STATEMENT OF DEEOHN FERRIS, ESQUIRE, PROJECT DIRECTOR, ENVIRONMENTAL JUSTICE PROJECT, LAWYER'S COMMITTEE FOR CIVIL RIGHTS UNDER LAW

Ms. FERRIS. Thank you, Mr. Chairman, and members of the committee.

I appreciate the opportunity to appear before you today to outline the extent to which environmental pollution and environmental health issues affect communities of color in this Nation.

As Program Director of the Lawyer's Committee for Civil Rights Environmental Justice Project, I focus on devising interdisciplinary strategies and mechanisms to influence governmental and private sector decisionmakers concerning disproportionate environmental risks experienced by people of color and the poor.

The goal of my project is to strengthen community-based environmental justice activists in their efforts to prohibit environmental discrimination and develop remedies for the adverse consequences of any prior discrimination. Our objective is to obtain equality by providing legal and technical resources for the needs of people of color ensuring fair, equitable political participation and eliminating all barriers to equal environmental protection.

The concept of environmental justice has emerged from the growing recognition that people of color and people with low incomes more often live and work in areas in the United States where environmental risks are high. People of color and people with low incomes are most often the unwilling recipients of hazardous waste sites, incinerators, industrial production facilities, pesticide and radiation exposure.

Furthermore, communities already adversely affected by disproportionate pollution risks in the ambient environment may be inundated by indoor air pollution caused by lead-based paint and occupational exposures in the workplace.

Race is a determining factor in disproportionate exposure to pollution. Racial disparities in the treatment of pollution risks are verifiable. Increasingly, evidence produced by Government agencies, scholars, attorneys, scientists, journals and citizens demonstrates that even more important than income, race is the determining factor in terms of who is exposed to higher levels of environmental contaminants.

In general, communities of color face pollution exposures at levels and multiple exposure combinations not regularly experi-

enced by other segments of our society. Documentation of disparate exposure dates back at least two decades. Regional and nationwide studies dating back as far as 1971 show significant exposures for people of color as compared to whites to noise, hazardous air pollutants, siting of commercial hazardous waste facilities, uncontrolled toxic wastes, water pollution, radiation, pesticide poisoning and location of solid waste landfills.

Even the Federal Government has documented inequities in the south in a 1983 report by the U.S. General Accounting Office. Very recently, the State of New York and Johns Hopkins University studied and correlated data on birth defects and other health defects associated with proximity to waste sites.

Prioritizing protection of human health is a key to resolving disproportionate environmental impact. Prioritization should focus on improving environmental programs as they affect people of color. Integral aspects of improving these programs include a targeted governmentwide research and development agenda and restructuring Federal activities regarding data reporting, data collection and analysis.

Emphasizing scrutiny on the health and environment of those populations most exposed and most sensitive to environmental contamination during the regulatory development process will support development of regulation to protect inundated communities in particular, as well as the general population.

Revising risk measurement and monitoring systems and improving the effectiveness of exposure data correlation to encompass synergistic effects, multiple sources and sensitive populations are ingredients essential to ensuring quality of life for overexposed communities.

Unequal enforcement also contributes to potential health hazards. The evidence indicates that the Federal Government's compliance and enforcement response in communities of color is unequal to compliance and enforcement in white communities. Federal agencies with jurisdiction over environmental issues directly affecting people of color are integrally involved in permitting, compliance and enforcement activities, that have wide-ranging implications for effected communities. The Federal Government is uniquely positioned to demonstrate leadership which will ensure that the constitutional principle of equal protection is implemented in all aspects of Federal sector enforcement activity.

To conclude, the Federal Government must immediately undertake initiatives to remedy hazards posing disproportionate risks to the health and environment of people of color in this Nation. Committed leadership in the Federal sector is crucial to ensuring that communities of color no longer bear a disproportionate share of our national pollution burden.

In terms of alleviating discriminatory impact, a coordinated Federal approach to environmental laws and compliance and enforcement activities is integral to focusing already limited resources into areas where they are most needed and most effective.

Thank you.

Senator BAUCUS. Thank you very much. Do you have a book too?

Ms. FERRIS. Next time.

Senator BAUCUS. Dr. Rall?

STATEMENT OF DAVID RALL, FORMER DIRECTOR, NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES, FOUNDER AND FORMER DIRECTOR, NATIONAL TOXICOLOGY PROGRAM

Dr. RALL. Thank you very much, Mr. Chairman and Senator Boxer.

I don't have a book but I have a thin article, properly referenced that I'd be delighted to submit it for the record.

This hearing is on "Taking Stock, Assessing Environmental Threats." I want to talk primarily about one aspect of assessing environmental threats and that is the use of laboratory animal testing in identifying and making it possible to prevent threats.

The important feature of laboratory animal tests is that they can show serious health problems that are likely to occur to humans before they occur. They are analogous to the mythical medieval potentate who always fed a bit of his dinner to the court jester to see if it was poisoned. He didn't understand about late effects, however.

Preventing or lessening human exposure to chemicals shown to be toxic can prevent carcinogenic, neurotoxic, reproductive or any number of many chronic effects. The issue really is how well do the animal tests predict for the human population. I think the answer is quite clear, pretty well, but not perfectly.

I am unaware of any biological system that achieves perfection. Biology is too complicated a science, too complicated an affair to allow for perfect simplicity. It used to be a safe statement—in fact, just a few days ago, you could have said, we know one thing about bacteria and that is that they are microscopic organisms. Now we know that they can be as big as a hyphen. Somewhat disturbing.

There are objections to chemical testing and its use in risk assessment, I will try to touch on a number of these. In the submitted paper and in my written testimony, I go into much more detail.

There's been much criticism of the use of high doses in testing, maximum tolerated dose, and yet this is necessary because you use only 50 to 100 animals to try to project for 100 or 200 million exposed people. In a recent series of tests from the National Toxicology Program, 52 chemicals were tested. Of those, only three were positive only at the high dose. The other 49 were positive at the high dose and smaller doses under the high dose. It is easy to pick out the one, two or three percent, or six percent that are the exceptions, and focus on those but ignore the fact that typically, many more doses in the high dose are positive.

There's been discussion about cancer prone rodents. If you plot the cancer rate of the typically used mice and rats against the age of the animal, you can superimpose this pretty well over such a plot for the United States population—very little cancer early in life and then it goes up near the end of life. Overall, the rodents that are used in the testing program are no more sensitive than humans.

Every compound that's been shown to be carcinogenic in man, when properly tested, has been shown to be carcinogenic in laboratory animals, and in fact, arsenic is pretty well shown to be carcinogenic in animals. The evidence is not as clear as we'd like it but there is considerable evidence it is a carcinogen.

There are eight or ten chemicals—DES, vinylchloride, and so forth—that were shown to be carcinogenic in laboratory animals first and later we discovered in humans that they were carcinogenic.

Another point I think is very important to recognize is that most chemicals have not been adequately tested. A National Research Council report about a decade ago now showed that somewhere between 70 and 90 percent of the chemicals that we are exposed to had not been tested enough to provide for a reasonable risk assessment.

Other reports, the Agriculture Subcommittee on the House side, showed much the same thing for pesticides, and the OECD in its testing program has shown that most high level, high volume chemicals have not been properly tested.

A good example is 1,3 butadiene, first used as a component of synthetic rubber in the early 1940's, was not adequately tested until 1983 at which point very high doses were shown to be carcinogenic. Those high doses happen to be about the same as the OSHA safety level for 1,3 butadiene. On repeat tests, however, 1,3 butadiene when carefully studied was shown to be 100 times more carcinogenic than had been originally demonstrated.

I think we need to use animal tests, we need to take care of the animals properly; we need to use as few as we can to get the answer we need, but I think animal testing is really like what Winston Churchill said of democracy, it's not a very good system, in fact, really not good at all, but it's by far the best system we have to protect human health.

Thank you.

Senator BAUCUS. Thank you very much, Doctor.

Dr. Moore?

STATEMENT OF JOHN A. MOORE, PRESIDENT, INSTITUTE FOR EVALUATING HEALTH RISKS

Dr. MOORE. Thank you, Mr. Chairman, Senator Boxer.

Let me state in a most positive way that, as we look over the past two decades, Federal laws have led to very real gain in public health and the environment. My testimony gives a few examples. I'll just cite one this morning. Certainly the reduction of lead in motor fuels in this country is a very important public health gain, an action that was driven by the Clean Air Act.

This country, I think, should derive a fair measure of satisfaction in the very real progress that has been made in the identification and control of exposures to toxic chemicals. Yet, it would be wrong to assume that the challenge has been met and the environmental public health issues are behind us.

I think as we look forward we need to be cognizant that the nature of many public health and environmental health issues are changing. Current and future needs may be more difficult to address because compared to the doses and toxic effects observed some 20 years ago, tomorrow's toxic concerns may be quite subtle and levels of exposure quite low. I think Dr. Colborn touched upon that in her remarks.

For the last 15 years, the statutory and regulatory agenda dealing with chemicals has been dominated by concerns as to cancer risk. From a public health point of view, it is essential that as we go forward that we develop a broader profile as to the possible range or a chemical's toxic potential and not continue to be driven by what some people might call and I call, a myopic focus on cancer.

Unfortunately, cancer risk estimation, as practiced in this country, blurs any statement as to the qualitative scientific judgment that a chemical may be a human carcinogen. There continues to be, in my opinion, a over reliance on the ability to produce an adverse effect in test animals with minimal attention according to the likelihood that such an effect may be seen in humans. Let me illustrate.

Asbestos, when inhaled, poses a very real risk for the development of lung disease, including cancer. On the other hand, ingested asbestos, which occurs in a number of drinking water supplies in this country, appears to pose at best a negligible risk. Occupational or high exposure to asbestos in air has had tragic results as we all know. Yet only belatedly have we heeded the information which seems to underscore that asbestos in a building will pose more than a negligible risk only if that asbestos-containing surface is friable or deteriorating, and therefore, is going to find its way into the air that occupants will breathe.

By comparison, some people judge silicon to possess the potential to cause cancer. Isn't it also important to convey the very real differences in the certainty of belief between asbestos and silica as to cancer potential and the differences in the magnitude of exposures that are likely necessary to cause such an effect. Let us require information to be conveyed in a way that permits the public and the decisionmaker to gain a sense of perspective as they form an opinion on an issue. I, for one, still favor the availability of sandboxes for children, vis a vis the silica concern.

A seemingly vexing issue that is in current vogue is that laboratory methods used to determine toxic potential of a chemical for humans may provide misleading results. This concern has particularly focused in recent months on cancer tests. I think the real issue is how to revise the process used to judge that a chemical may pose a human health risk when scientific knowledge suggesting such a change may be warranted. Advances in research methodology over the last decade has made it possible in some instances to gain insight as to the biological processes that might have been involved in or lead to the observed adverse effect. Such insight can provide a better scientific basis for concluding that an effect seen in a test animal may, or may not, be likely to occur in humans.

In times when significant changes are occurring in processes that determine health risk potential due to the application of newer scientific knowledge, I think this committee would serve the public needs by remaining cognizant of three points.

One, detecting instances where a result in an experimental animal may not accurately predict an effect in humans does not erode the utility of this traditional testing approach but rather, it has improved the predictability of the approach in future applications.

Second, the process that is used to identify environmental health risks could create an incentive for the receipt and use of data that enhances our certainty of judgment. In other words, encourage the use of meaningful data rather than perpetuate the persistent use of default assumptions.

Third, I think I would strongly urge that you encourage the robust use of scientific peer review mechanisms that can provide timely assistance and advice to government in the use and limitations of new methodologies or advances in knowledge.

The changing nature of the ways by which chemicals gain entrance to our home and general environment indicates that there may be a need to revise the methods traditionally used to assess exposure potential to a chemical. Very real gains were realized in the past through a media-specific focus. Greater effort, I think, is needed to foster a holistic or life cycle approach. This approach goes beyond consideration of adverse effects associated with a specific chemical use to a consideration of the nature of adverse effects associated with say mining or production of the chemical, public or commercial use of the chemical, as well as its disposal or environmental fate. We should also seek to determine if there is more than one source or diverse sources of such exposure.

In summary, real progress has been made in identifying chemicals that can cause adverse health effects and controlling exposure to such chemicals. Continued progress can be realized only if processes used to determine potential health effects keep pace with advances in science and technical knowledge. Greater consideration needs to be accorded to determining the spectrum of toxic effects that may be caused by chemical exposure and in determining with greater accuracy the nature of those chemical exposures that produce significant health risks.

The challenge is to refine approaches so that significant public health and environmental risks are clearly identified and addressed in a timely manner.

Thank you.

Senator BAUCUS. Our final witness is Dr. Devra Davis.

STATEMENT OF DEVRA DAVIS, SCHOLAR IN RESIDENCE, COMMITTEE ON ENVIRONMENTAL EPIDEMIOLOGY, NATIONAL RESEARCH COUNCIL

Dr. DAVIS. Mr. Chairman, Senator Boxer, I want to thank you for convening this panel and highlighting some of the enduring problems that we face in environmental regulation.

I'm speaking here today as an individual scientist, not on behalf of any of the institutions with which I am associated. Copies of recent reports and books which I refer to in my written statement are available to this committee and some are appended to my written testimony.

I want to state for the record that I am in favor of butterflies and sandboxes and that I think with respect to sand in sandboxes, the issue is not children playing with sand in sandboxes, the issue really is what is the hazard to workers through a blast silica which becomes microscopic, airborne and infiltrates deeply into their lungs and has been associated with an increase in lung disease and

perhaps cancer. Those are the tough questions we have to deal with.

I want to take a moment and tell you a story about something in the 19th century that I think sets the theory in context and answers some of the questions you asked me last week about are we attacking the right problems, how do we know we have the right resources.

In the 19th century, as you know, most children did not live beyond childhood and we didn't fully understand what were the causes of the infectious diseases of which they died. In the middle of the 19th century, a fellow named John Snow had observed that the people who were dying more of cholera took their water from a certain supply. He astutely noted that if you stopped them from drinking that water, they would stop dying. In fact, he removed a pump handle, the famous Broad Street pump, a legend in epidemiology, and shortly thereafter, the cholera epidemic subsided.

The British were quite observant and pretty impressed with this so they figured, well, we'd better do something about this of a general nature and within two years of that, they had passed laws stipulating that all of London water had to go through some filtration system. They had absolutely no idea how filters might work but they figured that it would do something and sure enough, cholera began to decline at that point and continued a decline.

I am tempted, in light of today's *New York Times'* series, to point out that if OMB were around at the time, it might have conducted a cost benefit analysis and it might have said, where are the benefits? There's absolutely evidence it's going to do anything at all and it will have a major impact negatively on the industry.

Benefit assessment is one of the most difficult things you can do in revising environmental policy. It's hamstrung because we scientists can only tell you what we know. We know, for example, in the case of wood preservatives and Athrocene, only the animal cancer data at this time, but we have ample reason for concern that these compounds, which are estimated to cost billions of dollars in the regulation by OMB, have a number of effects, some of which Dr. Colborn has talked about and others of which have, by the way shown up in humans like ovarian cancer in women, that we have not put into the calculus that the OMB numbercrunchers are using.

So I call your attention to the fact that we have to be very what I would call premature quantification in these kinds of circumstances.

There is no question, as the *Times* has correctly pointed out, we are overregulating some risks and underregulating others. That is clearly a problem. The question this committee has to decide, the question that I think the American people want to consider is, which risk is it better for us to entertain. Is it better to run the risk that we will falsely exonerate something that is in fact a hazard or is it better to run the risk that we will falsely regulate something? The choice is not so clear; it's one the committee has to think about.

Are we better off erring on the side of overly protecting public health or erring on the side of overly protecting chemicals? It's not

an easy choice. It's not at all an easy choice. It's the way that the problem needs to be posed.

Recently, it's become, I think, fashionable to say that the solution to the problems we face in environmental complexity is that we need more science. People have wrapped themselves in the banner of more and better science. I'm a scientist and obviously I want to keep myself and my colleagues employed, but I want to suggest why there may be some problems with that.

Better science is being held up somewhat like a cross to the vampire as the thing that will solve the problems, transfix our environmental dilemmas and stay off economic ruin and devastation, but think about this.

It's possible that this focus on better science has some downside risks. We have to consider what is the risk of overregulation, that is, regulating something that doesn't need control, false positive, versus what is the risk of underregulating something, that is, something that is in fact dangerous calling it a negative, a false negative.

To put it simply, which risk does the American public want its Government to make? Should we err on the side of protecting too much for public health and the environment or should we err on the side of overly protecting chemicals and industry? I don't think the choice is necessarily clear, but I think that's the way we need to talk about it.

No matter how many breakthroughs we may make in the laboratory, scientists will never be able to resolve many of the bona fide conflicts and controversies surrounding how to conduct and interpret animal tests and the general problems of inconsistent setting of priorities.

So we are forced to delegate to the agencies these hard choices. We need to remember in doing that why we test animals, as Dr. Rall has pointed out, is we avoid testing people or avoid subjecting people to uncontrolled experiments. Animal tests are used as a means to prevent human harm and we use epidemiology, the field where I do most of my work, as a way to confirm harm that has already occurred. So we don't want to ever get in the position of saying it's a matter of public policy that human studies should be the requirement for regulatory action.

When we have human data, we should act on it. I would suggest that we have, in fact, misplaced some of our focus in a lot of environmental regulation. With respect to pesticides, we are making some mistakes, it seems to me. It is now legal in this country today for parents to shampoo the heads of their children with a prescription medication for head lice which is banned as a residue on raisins. This shampoo is called Kwell and it contains Lindane, a highly toxic compound that has been known to cross the barrier between the blood and brain and induce cancer and a whole bunch of other diseases in animals.

If you are to put it on your dog, you are directed by labeling directions to wear elbow-length gloves, waterproof apron and boots, and if you put it on your child, you don't have any such advice.

What makes this especially troubling is that a recent study, which I have submitted for the record, published by colleagues at the University of California in the Archives of Environmental Con-

tamination this past week, found that children on whom this shampoo had been used had significantly more brain cancer than children who did not. I'll repeat that. Children whose parents used this head lice treatment shampoo on them developed more brain cancer than children who did not.

A number of other indoor uses of pesticides also had been implicated as increasing the risk of brain cancer and other cancer in children. In addition, a number of studies at the National Cancer Institute by colleagues, Aaron Blair, Ken Cantor and Sheila Zahm, have found that farmers who worked with this same compound, Lindane, have higher rates of lymphoma and those who failed to use protective clothing had the highest rates. Thus, we have evidence that there are underregulated exposures and these are not trivial in levels nor in their consequences.

I am releasing to the committee today an article from Volume 100 of Environmental Health Perspectives which is about to be published in honor of Dr. David Rall, who was the distinguished director of that institute. In that article, we find some very important results.

Farmers in more than 20 studies conducted by some of the leading national cancer registries in eight different countries die more often of certain types of cancer. They also die less often of heart disease and lung cancer, probably because they smoke less. Farmers lead healthier lives in general.

The same types of cancer of which farmers are dying, namely brain cancer, multiple myeloma, prostate cancer, melanoma, those same types of cancer, we find, have also increased in developed countries over the past two decades. Of special concern to my colleagues and me is what could be behind these patterns. We do not claim to have the answer but we do think, in the case of farmers, a number of studies have shown that what they work with, in particular certain pesticides, engine exhausts, solvents, and animal viruses, have been associated with these increased rates in farmers.

Dr. Rall mentioned 1,3 Butadiene; that happens to be a constituent of fuel and we know that farmers are highly exposed to fuels, and we know the general public is getting more exposure as well through our own pumping.

So this leaves us with the question of do we need more and better science? I'm not opposed to more and better science, but I think it will not necessarily improve the situation. Rather, I believe we need to make better use of decision rules to address the kinds of concerns that Senator Chafee asked—when do we know enough to act.

All of the laws that have been passed thus far by this Congress are protective laws for public health. In fact, properly conceived, environmental protection becomes a centerpiece of efforts to reduce the demand for health care. If we succeed in coming up with policies to prevent or reduce some of the diseases we're talking about today, we will reduce the demand for health care and advantage the health care delivery system at this point.

We need a serious national discussion whether environmental policy should place greater urgency on overregulation or under regulation. If we have any hope of improving our current approach,

we have to rethink the kinds of evidence we require and the basis for regulatory action.

Those of us who care deeply about these issues will have a lot of work to do for some time to come.

Senator BAUCUS. I appreciate that very much. Thank you very much for that testimony.

Unfortunately, there is a vote now occurring. I'm going to recess the hearing at this point. Senator Boxer and I will return immediately. I would guess we will be in recess about 10 minutes.

The hearing is recessed.

[Recess.]

Senator BAUCUS. The hearing will come back to order.

There are a lot of questions to focus on here. Let me begin with a fairly general one.

There are hundreds, thousands, hundreds of thousands of chemicals in our environment. How do we know which ones to focus on first and what should the process be that determines which chemicals to focus on to determine their toxic or carcinogenic effects? There are going to be more chemicals as years go by, I assume, synthetically produced, synthetic hormones, for example, and we get into biodiversity questions as society evolves and changes. What is this process today, in this country, in trying to set priorities on all those chemicals and second, how can that process be improved upon? I'm just going to go right down the table and begin with you, Dr. Colborn?

Mr. COLBORN. We addressed this extensively at our work session at Wing Spread when the 21 people were together discussing this. We realized that there is no way you can finger one chemical. You cannot predict what one chemical will do in the presence of another. We have a number of very beautiful new studies that have been done that show this.

You can take groundwater contaminants like Atrazine, Aldicarb, Methomyl, Metribuzin and nitrates, take them all together and take a number of animals and use the various permutations and combinations of them in the water that the animals drink over a period of time, the same concentrations that people are drinking at the ambient concentrations we are finding today, and you cannot predict what the end points are.

We do know that various combinations, depending upon duration, the age of animals and the season of the year, you get endocrine effects, you get immune effects, and you get behavioral effects.

Senator BAUCUS. Let's look at the universe of all chemicals, what's the process?

Mr. COLBORN. That's just background. Basically, what I want to say is we feel that we just can't add any more new chemicals to the environment, that somehow, some way, across the board, we have to put a regulation or a stipulation out that any new chemical that's going to be used in large volumes or released in large volumes—this would be the precursors and also the metabolites of the products that are to be released into the environment—must be tested for noncancer health effects first.

Senator BAUCUS. If there are no new chemicals, there are still a lot out there now.

Mr. COLBORN. That's right.

Senator BAUCUS. So how do we know which ones to really focus our research on?

Mr. COLBORN. Then you go to the literature and you look at what is causing a lot of the problem, where are you finding the problems?

Senator BAUCUS. Individual scientists or individual organizations, or is there some kind of organized way to get at this?

Mr. COLBORN. We have a lot in the database already. There is a tremendous amount of literature out there that describes the hot spots around the country. We need to do more investigative work. I call it forensic science, which the Federal agencies do not have the money to do, they cannot send people into the field looking for the damage and then bring the damage back into the laboratory and try to find out what was causing the problem. You bring in the sediments, you bring in the fish tissue, you find out what is in the sediments and fish.

Senator BAUCUS. Ms. Ferris, your response to that general question?

Ms. FERRIS. We proposed in the testimony that I submitted today a new evaluation framework for chemicals.

Senator BAUCUS. The burden should be on the manufacturer?

Ms. FERRIS. Pre-manufacture and post-manufacture. We think a lot of chemicals currently on the market need to be reevaluated. This pre-market and post-market strategy would involve a hierarchy, evaluation of a hierarchy of things. For example, we think that key elements of this evaluation framework should include assessments of the following characteristics: multiple and synergistic exposure pathways, health and environmental effects, including effects on sensitive populations, product safety, the need for the substance, the availability of less harmful substitutes and alternatives, persistence and degradability of the chemicals and bioaccumulation factors. We think an examination of chemicals on the basis of those characteristics would yield a lot less poisonous chemicals on the market or continuing in the stream of commerce.

Senator BAUCUS. But what burden of proof would the manufacturer have to meet?

Ms. FERRIS. We think that evaluation framework would substantively shift the burden of proof to industry to prove the safety of its products.

Senator BAUCUS. But does that change the matter? How safe is safe still is the question that must be answered.

Ms. FERRIS. Well, that's the thorny question that I don't think I have the answer to.

Senator BAUCUS. What's the steel trap answer.

Ms. FERRIS. I'd be trapped if I tried to answer that.

[Laughter.]

Senator BAUCUS. What's the precise answer?

Ms. FERRIS. I think that's what we're here to suggest that the Federal Government needs to take a closer look at in order to come up with the answer.

Senator BAUCUS. The question is, how would we determine how safe is safe.

Ms. FERRIS. Perhaps there is no answer to how safe is safe and the real question is not how safe is safe, perhaps, but more so how much do we have to know before we act to protect human health and the environment? At some point, we need to make a cut off and decide that we'll protect human health and the environment.

Senator BAUCUS. We'll get to that question a little later.

Dr. Lovejoy?

Mr. LOVEJOY. If I was trying to look at it from my background, the cut I would take at it is to look for aberrations in wild species that can be traced to chemicals out there in the environment and I would try to home in on those, on the reasonable supposition that if they're showing problems in wild species, they could easily later show up in humans. So it would just give you a first cut of things to look at.

Senator BAUCUS. How reasonable is that supposition? What's your basis for thinking that it is reasonable?

Mr. LOVEJOY. Well, I think I'd rather leave that to somebody who is a better epidemiologist than I, maybe Devra or whoever, but certainly the classic example of DDT showed up in a variety of wild species long before their concerns about possible effects on factory workers and others. The peregrine falcon disappeared from east of the Mississippi, that's a pretty dramatic change. So it was sort of an early litmus paper, an early signal.

Senator BAUCUS. So one approach is to look at species. That is, if a certain species is declining due to perhaps some chemical effect, that's an area in which to look?

Mr. LOVEJOY. Yes, exactly. Or, for example, in the Chesapeake Bay when there were problems with tributyltin being used as a coating for ships to discourage barnacles and other growth, all of a sudden they started finding species of snails which the female snails would grow penises. That's a pretty serious signal about having to be careful with chemicals.

Senator BAUCUS. Dr. Rall?

Dr. RALL. There are a lot of ways of approaching the problem. It's a problem we've all worried about, but probably not worried about enough.

One is the sort of surveillance program that we've just heard described and this can be ecological surveillance or it can be human health surveillance. Vinylchloride, although I pointed out that it had been determined to be carcinogenic in laboratory animals, was not brought to the world's attention until there was a cluster of six or seven cases of an unusual carcinoma in a single plant in Louisville, Kentucky. So, this surveillance that here is an unusual health outcome, let's try to track it down.

The other way is to look at those chemicals which are being introduced into the human environment. Dr. Jack Moore should be an expert on that, but I want to have my say first.

There are two ways of looking at chemicals. One is toxic do you predict they are? You can predict fairly well except for absolute equal chemical structures the extent of toxicity, so that's one system of how toxic do you think this is going to be. If it looks like it's going to be toxic, if it looks like it's going to be persistent, that goes high on your list of concern.

The other is simply how extensive will the exposure be, how much of the chemical will be produced, how much will be in the environment, how much will people be exposed to? That is very, very important because we don't know enough to properly predict toxicity from just chemical structure. We need to also worry about the chemicals being widely dispersed.

So, three ways, surveillance programs, and also chemical surveillance—what new is coming into the chemical process, what new structures are being born? Are bucky balls toxic for human health? I have no idea. This is the problem of predictive toxicity and extent of human exposure.

Senator BAUCUS. So part of that is just more research on human exposure? You're implying that is deficient today?

Dr. RALL. I think if people would really look at the problems in environmental health, they would find that it's not animal testing. It's the fact that we don't know what people are exposed to and we don't know how intensively they are exposed. That's one of the major problems.

Senator BAUCUS. That sounds like a very extensive undertaking though.

Dr. RALL. It is very extensive—lots of chemicals, lots of people, lots of routes of exposure.

Senator BAUCUS. Are we doing that in this country very much today?

Dr. RALL. I think we're not doing a good job at all.

Senator BAUCUS. Dr. Moore?

Dr. MOORE. Senator, let me certainly agree with Dave's and Theo's comments and Dr. Lovejoy's comments as well. You can use sentinels for effects that may be out there. You should always be alert to those types of effects, but let me try to highlight to you a couple of generic approaches that are in use today that I think may be worthy of some consideration.

First of all, there are some chemicals that you do require data on today as a condition of use. Pesticides are an obvious example of that. Now that we're finally filling the data gaps that exist in the datasets that we want for pesticides, that should be looked at very closely as it comes in. Beyond that, lets consider chemicals that you don't require such data as a condition of regulation or law. Looking at existing chemicals, as you point out, there's tens of thousands of existing chemicals. It might be of interest to take note of an activity that's going on within OECD, obviously with the participation of the United States. That is they've got a multinational commitment to look at existing chemicals, and the selection process is to look at chemicals that are produced in high production volume and presume, because of their high production volume, they have significant exposure to some parts of the population. That was their way to systematically start to work into the large number. The estimation is that they will probably do about a thousand chemicals, with a core of information being gathered on each one of those, probably by the year 2000. The results of the first sets of chemicals started to emerge last month.

Senator BAUCUS. Are we doing that in this country by volume?

Dr. MOORE. The burden of the testing, so to speak, is apportioned across the member countries of OECD as a function of how much

you produce. So the big people who are contributing to that effort as far as sweat equity and generating the data are the United States, Germany and Japan; other countries to a lesser degree.

The other point that I guess I would make is there has been some attempt to take the concept that first came out of OECD and apply it domestically, beyond what OECD is doing, by possibly using the 312, 313 exposure data as the basis of presuming there is exposure. And therefore, since we have this type of exposure occurring in this country, don't we want that same base of data.

As regards new chemicals coming onto the market, the Toxic Substances Control Act has a section 5 in it which does require review and a judgment made of every new chemical before it commences manufacture. I think it would be possibly worthwhile for this committee to take a look at how well that system is working. I think it's working adequately, but there certainly are significant limitations as to what one can and can't do with that system that maybe should be looked at and possibly improved. It is the only mechanism I know that we have in this country whereby one takes a systematic look at new chemicals before commencement of manufacture.

Senator BAUCUS. If TSCA is working, what about that shampoo example that Dr. Davis referred?

Dr. MOORE. TSCA would not cover shampoo because in the example she used, it's an animal use that she was describing, its covered by the pesticide law and its human use as a drug is covered by FDA. So TSCA would be foreclosed from taking action.

Senator BAUCUS. Should pharmaceuticals be subjected to TSCA?

Dr. MOORE. No.

Dr. DAVIS. Should they be?

Senator BAUCUS. Should they be? That was a facetious question.

Dr. MOORE. No, I don't think they should be. I think you should get the Food, Drug and Cosmetic Act to work.

The only other point I guess I would make is in this process of data being gathered, whether it be under TSCA or elsewhere, under pesticide laws or anything else, I do think a major problem from the standpoint of availability of information to the public is that most of that health and safety data still is basically buried in the files of the regulatory agencies. It is not available for public scrutiny. I think that's a problem.

Senator BAUCUS. What data is not available?

Dr. MOORE. Health and safety data is very difficult to make publicly available.

Senator BAUCUS. Health and safety data compiled by——

Dr. MOORE. By anybody. Usually by the manufacturers in this case or the users of that chemical. It's very difficult.

Senator BAUCUS. Because it's proprietary?

Dr. MOORE. Because of claims of confidential business information. There are legitimate confidential business information claims that need to be heeded. At the same time, I do think the process probably should be looked at with the idea in mind of maybe not over protecting or burying some of what I would call pure health and safety data.

Senator BAUCUS. How do you begin to get at that, that is, setting up a process that allows the proper information to be made more public?

Dr. MOORE. Well, in the example that I gave of OECD, by the nature that it's a multinational type of effort, all data that's being generated is in the public wheal. The area becomes a problem as it relates to confidential business information would be information on new chemicals according to the requirements of TSCA and also, the FIFRA requirements make some of that data very difficult to make publicly available.

Senator BAUCUS. Dr. Davis?

Dr. DAVIS. Let me echo some of Jack's comments. I think there are basically two different screens you can apply to this question of how do we handle the thousands of chemicals.

You could either go for the high volume chemicals, and that information is publicly available in terms of chemical production, or you can go for those for which you have data on their toxicity. Each approach, either high volume exposure and high toxicity, will give you a very different effect because there may be something extremely toxic to which there are a hundred people exposed. There are very few of those, experimental compounds, for example.

I would argue that we have to go for the high volume materials first and that this OECD activity is a very important step in the right direction in that I think it's going to be closer to 1300 when they finally finish and it is an activity that was spearheaded by the Swedes and the Europeans at a time when our Government was showing some reluctance to take leadership in this. Yet, I think at this point, with the change in Administration, we'll see some different changes in that as well.

Clearly, we are entitled to know what are the highest volume materials to which we are exposed and then, of those, which are the ones for which we have toxicity information. Then, which are we missing information on but we have millions of people exposed? That's a pretty important question. I would think that cut, if you will, would allow you to sort through and to start to gather data.

The kinds of data you gather, I think sentinel animals are really interesting for a number of reasons. Wildlife effects are what one might argue gave birth to the entire environmental legal movement in this country. It was the demonstration of thinning of eggshells of the peregrine falcon, it was the demonstration of these deformed chicks, it was the silent spring, a spring where songbirds no longer sang. Those things really happened and that was the beginning of a consciousness of environmental things in this country.

There are other things of that sort going on today now. For example, dogs of homeowners that apply lawn chemicals die more frequently of certain forms of cancer. Lawn chemicals turn out to be one of these uses of pesticides which is not regulated in the same way because people can buy it at the hardware store and apply it themselves. It is labeled, but how many people really read a label, how many people know that when a flea collar on their dog, their child should never touch their dog. It seems to me that is a bizarre thing given anyone who knows the way children and dogs interact with one another.

Those are the kinds of questions that I think are legitimately raised and sentinel studies in both wildlife, natural defects such as occur with fish cancer, as well as in companion animals such as the dogs I mentioned, can be very valuable as triggers.

I would like to argue as an epidemiologist that the last evidence you should require, the last evidence you should insist on having in order to take an action on a chemical should be epidemiology. Where we have epidemiology or human studies, it's almost always because we've had highly exposed workers or unusual exposure situations and we've had the good luck or good sense to collect the data and be able to confirm a risk that has happened 20 and 30 years later.

That brings us back to the animal testing world and there we have to look at what this past Administration has done. We say that animal testing is important, the only part of NIH to have had a cut in funding in real terms last year was the National Institute of Environmental Health Sciences. That is supposed to be the center of the Government's testing of chemicals. Last year, they started to test five times fewer chemicals than they did a decade ago.

Senator BAUCUS. In addition to animal testing and epidemiology, what about molecular cell structure and so forth? It just seems to me that's a new area?

Dr. DAVIS. Absolutely.

Senator BAUCUS. How far along are we?

Dr. DAVIS. We have improved tremendously in the use of human cell culture and in our ability to look at biological markers of exposure to some of these materials, in particular with respect to breast cancer. We have some studies developing.

Senator BAUCUS. Is this a promising area?

Dr. DAVIS. Absolutely, and one that should be encouraged and supported by this committee.

I want to further support something Jack said because I think it's very important and really merits serious attention of this body.

Confidential business information, under the pesticide law, under the TSCA law, can be asserted for a lot of things that are submitted to the agencies. When it comes to data on the health effects of chemicals, on what those chemicals do to animals or to humans, those data are often not available to the research community. They are submitted to the agency in compliance with the law, but not available for public review. That presents an enormous problem.

Senator BAUCUS. Thank you very much.

Senator Boxer?

Senator BOXER. Thank you, Mr. Chairman.

Let me take this opportunity to thank you for this hearing which is extremely important because we sometimes don't step back and assess where we are. The articles in the *New York Times* is something I want to ask all of you about.

Let me start my questions, if I might, with Ms. Ferris. I think it's very important that you are included in this hearing. We know, not only because of your testimony, but because of a GAO study that African-Americans are more likely to live near hazardous waste facilities and that people of color, in general, are, if you will, bearing a disproportionate burden in terms of environmental risks.

You talk about a constitutional argument which I find very interesting which is the equal protection clause of the Constitution, saying that this isn't right.

I would like you to reiterate, because I am not a lawyer, and some of your testimony was pretty legal for me. If you could give me, in about three or four sentences, what's the most important thing we can do to protect these communities, make them better, and then make sure that our laws are enforced so that we don't continue sitings in these communities? If you can give me the three or four most important things that we can do, and if you could tell us if you think we need something like the Environmental Equal Protection Act which would be a new way of synthesizing this problem?

Ms. FERRIS. I'd like to extend my thanks to the committee for inviting me to be here. I do appreciate the opportunity to talk about this.

Clearly, people in the environmental justice movement, activists in the movement, believe that the constitutional principle of equal protection applies to providing for all people equal protection from pollution or, to put it in another way, dispensation of equal environmental quality to everyone.

I think one of the problems in terms of Environmental Protection Agency implementation or application of equal protection principles is that the agency has never really taken a serious or made a serious evaluation about how its practices, policies and regulations affect communities of color. Hopefully, due to the movement, we've propelled that sort of evaluation.

What are the two or three most important things? At the top of my list I see, first of all, an absolute cessation of the continuation of placement of polluting facilities in communities that are already inundated. Second, the National Law Journal's report on equal protection identified Federal agencies, EPA in particular, across the board, environmental statute by statute, fail to equally enforce environmental laws and regulations in communities of color as compared to white.

Clearly, we need to step up the agency is doing in terms of initiating compliance inspections in inundated communities and initiating enforcement actions in communities that are experiencing disproportionate levels of pollution risk.

In terms of regulation, obviously the regulatory development process needs to be examined. We investigate and analyze paperwork burden, we investigate and analyze burden on small business, and we don't do a heck of a lot of analysis about impact on communities. Whether they are communities of color or white communities makes no difference to activists in this movement. We think obviously the protections extended to people of color are going to inure to the benefit of the general population. This is not a segregationist sort of thing.

Third, in terms of legislation, I think yes, perhaps, we do need to examine introducing legislation that reinforces the principles of equal protection in the context of environmental protection. There are deliberations on both sides of Congress about just that fact.

One piece of legislation that was introduced last year, which will probably be reintroduced this year, is going to be a landmark piece

of legislation to start us moving forward on that process. That is the Environmental Justice Act legislation which was introduced by then Senator Gore on the Senate side last year and John Lewis on the House side.

So my answer to your question about legislation is yes, I think that there is a role for this committee in making those kinds of evaluations. I would encourage the committee to work with community-based organizations and other organizations that are in the movement to help construct these kinds of remedies.

Senator BOXER. I really thank you for that. That was very helpful to me and I know when we questioned Carol Browner, the EPA Administrator, she expressed her knowledge of the issue and her desire to work with us. So maybe there is some way that she could appoint someone, Mr. Chairman, within EPA, to report to us on the status of this situation.

Has there ever been a lawsuit based on a lack of equal protection?

Ms. FERRIS. There have been approximately four or five lawsuits brought under the Constitution on racial discrimination grounds. Because when you file a civil rights lawsuit based on constitutional principles, you're required to prove intentional discrimination, it's been very difficult to make these claims. Very often we're talking about siting decisions that have been made 20 or 30 years ago based on zoning practices and it is very difficult to go back through the enormous public records and activities that occurred and piece together intentional discrimination.

An alternative is to apply extant civil rights laws which abrogate the need to make a finding of intentional discrimination. On the basis of statistics, one can demonstrate disparate impact and make that claim.

Senator BAUCUS. I know Dr. Lovejoy, you have to leave. I just wanted to thank you.

Senator BOXER. Oh, I had one question.

Senator BAUCUS. For him? Well, here's your chance.

Senator BOXER. Do you have time for one quick question?

Mr. LOVEJOY. Sure.

Senator BOXER. The Endangered Species Act is great fodder for those who feel the act is completely frivolous and ridiculous. There are cartoons about bringing progress to a halt because of the gnatcatcher and snaildarter and they always find very obscure species that they can make fun of.

I want you to expand on the Endangered Species Act, if you can, and perhaps give it your eloquence. If you could put it in words here so that I can explain to people who don't understand why it is important to have a strong Endangered Species Act that it relates to them and not just the endangered species?

Mr. LOVEJOY. My own personal view is there is little that is wrong with or needs to be adjusted in the Endangered Species Act. The problem is that it basically exists largely in a vacuum. It's designed to be a safety net, and doesn't kick in until an ecosystem, a whole aggregation of species, is in sufficient stress that the first species, whether it's the gnatcatcher or whatever, becomes endangered.

As you may know, I'm about to go over to Interior in a couple of weeks for a stint as Science Adviser to the Secretary, to look at this whole question of how you get ahead of the situation where you have a problem, how you can really assemble the information and recognize in advance that unless certain actions are taken, the ecosystem will begin to be under such stress that you end up having to use the safety net.

The way it is at the moment, we overuse the safety net. It's almost a random draw as to what's going to be the first thing in trouble. It's likely to be something nobody's heard of. It's likely to be something that it's hard to make a strong argument in the what good is it category, and yet it represents the whole aggregation. I think about the Old Growth Forest in the northwest and the spotted owl, and taxol which is important for breast cancer in the Pacific Yew. You have it all there in just that example.

Senator BOXER. Thank you, Dr. Lovejoy. I want to direct the next one to Dr. Colborn.

Dr. Colborn, your testimony was very frightening because what you're saying is that as bad as the development of cancer is, and we're all aware that overexposure to certain chemicals, drugs, smoking, what have you, can cause cancer, that there is something going on that you can't really see and that is birth defects which are not readily identifiable.

How widespread is this and how can we deal with this? Because we have focused on the cancer issue, how can we better deal with the issue of passing on to the next generation these defects which may not show up for a while? What is your suggestion to us?

Mr. COLBORN. Demonstrating the problems that I described at the population level is going to be very difficult. We do have evidence today, which was in my written testimony, that sperm count worldwide now has dropped approximately 50 percent since 1938. It was about 1938, 1939, 1940 when we started producing a whole host of these new chemicals.

These chemicals are small molecular weight chemicals that look like hormones, they look like neurotransmitters to the receptors in the body and our bodies function based on these hormonal signals that we send within our body. We know when we go into the laboratory and expose animals to these chemicals that these things do take place. The evidence is there as far as fertility is concerned whether an animal is exposed, whether the pregnant animal is exposed over her lifetime and then she gives birth to an offspring as a result of exposure to the animal, she will then have these offspring that are not fertile, that do not grow up in the normal condition that an individual would ordinarily.

We have enough evidence now that it's taking place with a large number of chemicals that we have looked at. All we can say is, you can't call this a disease condition; it's a change in how these individuals' endocrine system, immune system, and nervous systems function.

We know the women who were exposed to diethylstilbestrol in the womb—their mothers took this chemical which was an estrogen-like chemical between 1948 and 1971, we used it in this country to prevent miscarriages—those individuals today now have

been followed. The oldest ones in that cohort now are about 42 or 43 years old.

The women that have been looked at definitely have changes in their immune system. Their immune systems are different. We don't know what it means. We do know that these women are more prone to autoimmune types of infections. This is just one example. The evidence is just beginning to come in.

You can take a mouse in the laboratory and expose it to diethylstilbestrol and you can see tissue changes very early on in the lining of the reproductive tract in those mice. You can see these same changes today in women who have been exposed to diethylstilbestrol.

Senator BOXER. So when chemicals are tested, are you suggesting that we spend more time testing them for possible birth defects? Should we put more stress on that?

Mr. COLBORN. Yes. We still have to test for cancer and we run through waves of rats exposing them to chemicals and we look for cancer. While we're looking for cancer, we can start looking for these other effects. What is happening to the immune system, what is happening to the endocrine system, how are these animals behaving? We haven't taken the time to look at these very sensitive end points.

Some of the end points are very subjective. If you look at behavioral responses, they are very difficult to measure.

Senator BOXER. We don't want to become the next endangered species.

Mr. COLBORN. So the point is we have to do the same testing. We need to do the laboratory testing with the animals through multigenerations to find out what in essence takes place. It's going to take a little longer and it's going to be more expensive, but we do have what is called the in vitro test where you can take human tissue, put it in a petri dish and you can expose it to these chemicals and you can screen it for certain aspects of the hormonal changes in those cells.

They will not always predict the changes in the secondary sex organ development or in the behavior of the individual but it's a good screen to start with. There are a lot of short cuts.

Senator BOXER. Thank you, Mr. Chairman.

Senator BAUCUS. Thank you very much, Dr. Colborn.

Senator Faircloth is next but I think Senator Kempthorne has a statement to make.

Senator KEMPTHORNE. Thank you very much, Mr. Chairman.

Unfortunately, I have a conflict in my scheduling this morning which will continue, so I would just ask, Mr. Chairman, that I be allowed to submit my questions to panel members for the record.

Senator FAIRCLOTH. Thank you, Mr. Chairman.

I want to thank you all for being here today. I come from the private sector as a farmer and businessman. My entire life has been spent with land and water which I understand very clearly. Environmental protection always has been, and will continue to be, a top priority.

The *New York Times* has just reported that government and private sectors spend $140 billion on environmental programs in this country. As a Senator, it is our responsibility to make sure these

programs are effective. With a $4 trillion debt, this Congress cannot, in good conscience, tolerate gold-plated programs, whether they are run by the Pentagon or the EPA. In fact, I imagine that the entire year will probably be spent arguing over how to find the money to maintain the programs we have and to create more.

Clearly, the Superfund is a gold-plated program, spending $11 billion over the last decade to clean up 120 toxic waste sites; 60 percent of this money, over $6.5 billion, has gone for administration, didn't even touch the sites. Government must learn to do more with less because the taxpayer is at a breaking point and going beyond the breaking point.

I urge the witnesses to tell the committee how we can make programs more effective. One environmental activist was recently quoted as saying, "We have to offer scare scenarios, make simplified, dramatic statements, and make little mention of any doubts we may have in order to excite the public and get the money to do things."

The time for scare stories ought to be over. It is time for reasoned judgment and common sense to prevail.

Would anyone like to comment?

Senator BOXER [presiding]. Why don't we ask the whole panel if they might react to the *New York Times* story? I think it is a very relevant question. Can we start with Dr. Davis?

Dr. DAVIS. Well, you said that we're talking about spending $140 billion and it may be that we need to spend that or even more but we're not spending it on the right things. We are spending $800 billion on health care at a time when that's 14 percent of GNP and those costs are estimated to go up no matter how well we reform the system if all we do is make it more efficient at processing sick people.

So it is worthwhile, I want to say at the outset, to invest in environmental protection if we can figure out how to make those investments reduce the damage to public health and the environment. That's the real question you're asking.

I think you're going to have a hard time finding anybody here to defend the Superfund program. However, from what I know of it, and I am no expert, the administrative costs to which you refer are, in part, accounted for by the newness of the program, but there seems to be little excuse for its relatively small payoff at this point. A lot of serious questions are being asked by this Congress and by the administration about the relative priorities that this country ought to invest in environmental protection. So you're raising a good question.

I want to comment on something else in the *Times* today. There was a table from the Office of Management and Budget that was generated as an estimate of the relative amount of money spent per life saved. You may have seen it. It was a big chart.

Senator FAIRCLOTH. This is by EPA?

Dr. DAVIS. No. The table was generated by the Office of Management and Budget. I believe, in fact, that it had its origins during the Bush Administration and the people at OMB decided to calculate what are the relative cost of a life saved in terms of regulations that have been developed. You will note, although I don't have it in front of me, that toward the end of that table is some-

thing called "the cost per life saved from wood preservatives." If you have that there?

Senator FAIRCLOTH. I have it.

Dr. DAVIS. Could you tell me what the number is? It's very, very high. It's the very last one there.

Senator FAIRCLOTH. The costs of hazardous waste listed for wood preservative, that's $5,700,000.

Dr. DAVIS. I think it comes out to $5 billion or $5 trillion.

Senator FAIRCLOTH. So it would be $5,700,000,000.

Dr. DAVIS. That's a ridiculous number and immediately you think that's preposterous, how can we possibly do that? Wood preservatives—pentachlorophenol—induce a whole bunch of other effects besides cancer. That number is based on one thing, an animal test and the level at which that chemical caused cancer in 50 percent of animals. The assumption is that you've done an estimate of how many cancers you will avert, how many cancers you will avoid if you regulate these materials. Then you calculate what the cost is per life saved.

The problem with this, and it's a fundamental problem, is that there are other health effects associated with pentachlorophenol. It causes some of the effects that Dr. Colborn has been talking about which we cannot, at this time, quantify.

We have to be careful, and I'm sorry you weren't here when I talked about my example of the 19th century, which I'll repeat. Removing the pump from a dirty water supply saved lives in the 19th century and we didn't, at that time, have any idea what was in the water that was killing people but they took the pump away.

For some of these environmental chemicals, and pentachlorophenol may be among them, they will have effects on wildlife. Dr. Lovejoy testified to the fact that there are fewer butterflies. Pentachlorophenol is toxic to those kinds of animals as well. They may have a lot of other effects than those that we scientists can't today quantify for you.

So I would just say the Times has done something important, but we have the problem that when it comes to estimating costs and benefits, we can only quantify the benefits that we have already measured for you in some system like these cancer animal tests. There may be others involved.

Having said that, I think the basic point you raise and the Times raises, is still a fair one, are we spending our money on the right things, are there more important problems? As I said in my written testimony, we are not. We have failed to provide adequate protection to industrial workers, 40 million of whom are exposed to unnecessary high exposures on the job.

To give you an example, yesterday, this Government announced they would not appeal the ruling on OSHA that said that standards for about 400 different hazardous substances would have to revert to the 1968 level. The court turned down the standards that were more stringent.

What this means is that workers are now legally exposed in some cases to levels of carbon monoxide under the OSHA limits that are now going to stand that could, in fact, kill a worker, but it's legal. We face those kinds of problems. Those are the issues this country needs to address. That will require your attention.

Senator FAIRCLOTH. How do we reassign the amount of money available? We are rapidly approaching the cold knowledge, in this country, that we are not a wealthy Nation with infinite resources. They are going to be very restricted in some years to come and the needs for them, as you mentioned—Medicaid, Medicare—the needs are infinite and the resources are very finite. How do we restructure wisely when there are going to be literally thousands of pulls and tugs for these resources to treat the people that are already sick, to create environmental programs, to prevent people from getting sick? How do we do that wisely in a free democracy?

Dr. MOORE. Senator, if I might make a couple of observations on your last question as well as your previous question. Without getting into whether or not a figure of $140 billion is the right number to be spending on environmental protection in this country, whether it should be higher or lower, I think the mood of your question is, is the money that we're devoting being spent wisely and indeed are we getting a return on our investment. In the context of Superfund, I think there's a lot of people who feel that we are not getting as much a return for our investment as one should legitimately expect.

In deciding how one starts, where does one begin, I think there still is merit to trying to come up with some type of a system that would help to identify what has been termed by other people, including the Carnegie Commission, the "worst risks first." I'm not sure that one wants to presume that a technical or a scientific process can tell you that what is listed 35th on that list is more important than 36th, but the point is the things that are listed in the top ten probably are worthy of attention far earlier than the ones that might be listed as 180 to 200.

I think that we need to try to use our talents to identify those risks that are really egregious and use that as your basis of initial focus. If part of that means Superfund, that's fine; if part of it is pesticides, that's fine; whatever the case may be.

The other thing that I think one has to do in the context of once you've identified chemicals is to get to the point of "how clean is clean?" Once you've identified a site that you want to remediate and it is legitimate to remediate it, when can you say that you're finished? How much money are you going to pour into that before you can come to the conclusion that I've done well enough? We struggled with that in Superfund legislation and in other issues as we sit here today.

The other thing in the context of Superfund that I think might be worthy of giving some thought to, and it's been given short shrift to date, since we seem to have an ability to find Superfund sites far faster than we can do anything about them, maybe we need to take a hard look at some sites and say, gee, the prudent course of action may be to make sure that site is contained, it's not spreading somewhere and as long as it's stabilized and contained, maybe that's the right solution for that one. Particularly when the technology that is going to have to be applied to do something about it maybe isn't very good today.

Right now, we basically just find a site and we have to clean it up. That may not be the most prudent use of finite resources in a number of those sites.

Senator FAIRCLOTH. In other words, chainlink fencing might be the cheapest utilization of some of it.

We have to have public support. Without that, it will not happen. So many of the programs have gotten into what the public considers minutia.

Last year, the Government spent $3 billion removing asbestos from buildings. Yet, one of the largest studies, studying miners in Quebec, found that miners of asbestos had a lower level of cancer than the general population. I'm not arguing the points of whether asbestos causes cancer or not, but how many billions of dollars can we spend removing every particle of asbestos from every building or tear it down?

Then there was the student from the University of North Carolina who determined that beach sand would cause cancer. He's from North Carolina. A lot of North Carolinians are going to have cancer because they all head to the beach on Friday afternoon at 3 o'clock.

Do you think that there is any possibility that cancer scares on asbestos, beach sand, and radon are overblown and would the public health actually be improved if we spent the billions being spent on asbestos removal and on other health priorities, for example immunizing children? Have we gone off on a tangent, are we spending money on fringe areas when we could better pull it back? Respond to the asbestos and some of the beach sand research?

Dr. MOORE. Senator, I don't think you can overreact to the fact that asbestos is a known human carcinogen that can also cause other types of disease. Anytime asbestos is present, you'd better have a healthy respect for it.

In the context of what you have mentioned, which was remediating asbestos in schools, in those instances where that asbestos was well-contained and was not posing a problem, one could make a case that it would probably be best to leave it alone and continue to monitor that it stays in good shape as well as maybe alert the custodial staff and other workers that are in those buildings that as they get into doing some of those things they have to do, that asbestos may be there and take appropriate precautions if they have to penetrate those areas of asbestos.

To suggest that asbestos should not have a healthy respect is dangerous, I think it should, but that doesn't mean that the mere presence of asbestos is going to pose a problem. That's where I think you've got to put some common sense into the equation.

Senator FAIRCLOTH. That's what I mean. There is no question that asbestos is harmful but how much of our national limited wealth do we spend on immunizing children or digging up asbestos tile that's been on the floor for 40 years?

Dr. MOORE. In the example you give, I'd much rather see us become a little more aggressive in the immunization of our children.

Senator FAIRCLOTH. There were a number of Government reports back in the late 1970's and early 1980's that clearly said if the asbestos is in good shape, it should be left alone and you only put a little plaque up saying this is asbestos. Renovation and mediation was only for the friable asbestos?

Senator BAUCUS [presiding]. That's right. That's an important point to make.

Dr. RALL. Somewhere along the early years of the Reagan Administration, that message got lost and I don't know how that happened.

Sand. I think there is a basic confusion here that silica dust, that is carcinogenic and causes silicosis, a very nasty pulmonary disease, is very fine particles that only occur after drilling and grinding, and these do not occur in the North Carolina beach. So there's a play on words that I think is really not quite proper. Silica dust generated in drilling tunnels is lethal. There is an incredible case of some hundreds of people killed at Gauley Bridge, Hawks Nest in West Virginia, but beach sand, I can attest to. It's a very safe and pleasurable commodity.

Ms. FERRIS. Senator, may I make a comment to address some of the concerns that you've outlined? I'd like to make a comment with regard to some of the concerns that you expressed. I'd like to echo the sentiments of my panelists who have articulated that we're really stuck here. In order to make progress on a lot of these issues, we are going to have to spend more money, more efficiently.

I'd also like to point out, for example, that there are some program areas that are on the books or on the board, or some initiatives that we can undertake that will help to reduce costs in the future. For example, Superfund, the great, tragic promise of Superfund that we all are so aware of, spawned the Community Right to Know Act. The Community Right to Know Act, in turn, spawned a great interest on the part of the public in what chemicals were being emitted into their communities.

The public interest propelled the pollution prevent initiative that is underway in this country. This pollution prevent initiative I think you would even get testimony from industry has been established in many instances to be a very cost effective way, a very economical way of doing business. Those are cost savings that industry will be able to realize over the course of time.

Traditionally, the Community Right to Know Program has been fairly underfunded at EPA and perhaps the committee could take a look at that program and whether or not some decisions can be made to put some more resources into it.

Second, I'd like to mention that sunsetting is a concept I think whose time is well overdue. If we begin to take a look at these chemicals and start to reduce the volumes of the chemicals that are most problematic, reduce the volumes of those types of emissions into the environment, we're going to realize most likely health savings in the long run in terms of peoples' exposure to those types of chemicals.

I would commend to the committee an examination of pollution prevention and where we are with pollution prevention, and how much a real initiative in this area might constitute a cost savings, an examination of safe substitutes for chemicals that are already on the market, toxics use reduction. These are prevention techniques that can be applied where feasible to reduce some of the problems that we are dealing with now.

Senator BAUCUS. I agree with you. In fact, we had a hearing on that subject just a couple of weeks ago.

Senator FAIRCLOTH. Ms. Ferris, you mentioned one point. Not being a veteran of the Senate, I haven't yet heard of a program that wasn't underfunded. There must be one out there somewhere and maybe I'll run across it, but I haven't yet heard of it.

Endangered species; in North Carolina there is a small town called Wilson that is trying to build a water plant. A small, fresh water clam has brought it to a screeching halt. This mussel is found up and down the east coast. This is a relatively poor community, as communities go, so it's not in much of a position to defend itself.

I'm wondering if the Environmental Protection Agency—and this is an area that Ms. Ferris has been working on—has chosen the weaker communities that are not in a position to defend themselves to find so many of the endangered species and the wealthier areas that do defend themselves where we don't find so many endangered species?

Mr. COLBORN. May I comment on that?

Senator FAIRCLOTH. Absolutely.

Mr. COLBORN. My home is in the mountains of Colorado where we do have rural areas and rural USA is economically depressed, but we have a wonderful quality of life and that's why a lot of people live in communities like that.

It's also in those areas where we still have species left where we have not developed, we haven't had industrial activity, we haven't had a lot of housing and a lot of building, so the remnants of our heritage, our natural heritage that are left are now in these rural areas. This is a very difficult problem to address. I wish Tom were here but I think you have to take that into consideration.

Probably the only place we're going to find endangered species now are in the rural areas, the backwoods. You're not going to find them in the hearts of big cities, I'm afraid, or in areas where we've done a lot of industrialization.

Senator FAIRCLOTH. If I understand what you're saying, to a Town like Wilson, North Carolina, you didn't build a big water system 30 years ago because you didn't need it, so now you can't build one, you missed your opportunity to grow. Is that what you're saying about the rural areas?

Mr. COLBORN. No, I'm not saying that. That's one of the problems we have to face today. It's a very, very difficult problem to address, and it's something that we need to sit down and look at.

I said just wish Tom were here but I wanted to point that out. This is another problem that the rural areas have to deal with. I'm taking the side of Ms. Ferris in this instance. I'm a citizen living in that town, I need my drinking water, definitely. This is a very serious problem and we're going to have to look at it.

If you are correct and this wharf-wedge mussel is common up and down the coast, then——

Senator FAIRCLOTH. Fifteen places have it. I don't know how many they have in each place.

Mr. COLBORN. I think these are things that are going to have to be addressed. They have to be worked out, definitely. I agree with you, it's a very serious problem.

May I just point out one thing here?

Senator BAUCUS. Quickly. We have a lot more to cover yet.

Mr. COLBORN. We were talking about the economics of the problems we're facing today. If we had paid attention back in the early 1940's and the 1950's to the warnings about the chemicals we released into the environment that we're so troubled with today, we wouldn't have these tremendous costs today.

My argument is let's not make the same mistakes over again. Let's look very carefully at anything new we're going to be releasing into the environment. Yes, we're going to have to live with our Superfund sites. I think we're going to have to have no man lands around the country where people don't go.

I agree with you 100 percent. We don't have the technology to clean it up, so that's basically what I wanted to address. We've got to prevent creating more costs and prevention is our best tool truly. Unfortunately, we always work reactively.

Senator FAIRCLOTH. Dr. Colborn, it's easy to look back and criticize, but you're talking about the early 1940's. I don't know where you were, but this country had much more urgent problems in the early 1940's than worrying about the environment.

Mr. COLBORN. I agree. We were winning World War II. Yes.

Senator BAUCUS. Do you have more questions, Senator?

Senator FAIRCLOTH. No.

Senator BAUCUS. Thank you.

I'd like to address the fit or the lack of fit between the risk that occurs in the environment to human health and to other ecological problems and our environmental statutes. That is, to what degree is the danger met by our environmental statutes, the Clean Air Act, the Clean Water Act, the Safe Drinking Water Act, et cetera, and to what degree is it not, in your view?

Let me start at the other end of the table. I'll start with Dr. Davis. Just generally, your overall impressions because, after all, this committee authorizes environmental statutes. Why? Because we think there is a risk, a threat. We want to make sure the remedy fits the problem.

I'm asking you to what degree does the remedy fit the problem across the board in various statutes and to what degree not?

Dr. DAVIS. Well, I think if you look at the history of environmental law in this country, in the 1970's, we had a flurry of activity to come up with what was the environmental decade, Clean Water, Clean Air, TSCA, and then later on RCRA, Superfund. With Superfund it was named CERCLA because we felt we were completing the circle.

In fact, many of the things I talked about today as examples of underregulated risks may fall outside the purview of this committee.

Senator BAUCUS. That's OK.

Dr. DAVIS. For example, the workplace, farmers. Farmers, I believe are not adequately protected in this country today. Information to consumers on indoor use of pesticides, do you think parents would put flea collars on their dogs and no pest strips hanging over their children if they thought there were going to be risks to them?

Senator BAUCUS. You're addressing where the protection is inadequate.

Dr. DAVIS. Obviously the Superfund Program has not achieved the goals it was intended to achieve. I think no one would quarrel

with that at this time. I would point out that fewer than one percent of the billions of dollar spent has gone to health research to evaluate the nature of the risk. The presumption has been we need to move these tons of earth around without really knowing what the public health impact would be. That, I think, is a fundamental failing of that law.

The law said you would do health assessments, it never got adequately funded. I think within the program money should have been shifted around, not that it needed more, but there needed to be more investment if we try to characterize the nature of the health risk there.

Senator BAUCUS. So now you're in the category where the statute went too far?

Dr. DAVIS. Or within it, the allocation of resources within the statute.

Senator BAUCUS. Are there any other areas where there is inadequate statutory protection or that inadequately addresses the problem?

Dr. DAVIS. I confess, I'm an optimist and I'm a believer in good government. I think the one thing we have been missing, I hope until very recently, is trust. I think the public has lost trust in the Government. I think people are distrustful of the extremes on these issues with good reason.

My answer, therefore, Senator, is the following. We have, I think, some pretty good laws with the exception perhaps of Superfund.

Senator BAUCUS. Any other perhapses?

Dr. DAVIS. None that comes to mind right now except that the pesticide law, with its provision that keeps secret information on health and safety and the toxic substances law with its provisions that also keep secret information on health and safety need to be changed in that regard.

I believe the laws are adequate if they will be administered fairly and if there will be more coordination between the regulatory agencies.

Senator BAUCUS. Dr. Moore?

Dr. MOORE. Senator, I think there's an area that may be deficient as we look to the future and how well our existing statutes work. As you well know, most of our statutes are media-oriented—Clean Air, Clean Water, et cetera. As I mentioned in my testimony, a number of the issues that face us today crosscut the media. It's not a problem peculiar to water or a problem peculiar to air. There may be some merit in trying to look at a statute that allowed one to do a better job of crosscutting the media in its approach.

Senator BAUCUS. You're basically saying that there are inefficiencies which cause unnecessary economic costs? Is that what you're basically saying?

Dr. MOORE. Yes. Historically, one can look at the need to control hazardous wastes, and we basically controlled it out of water by emitting it to the air. Then we have to have an air statute that does something to that and now we've put it on the land. So all we're doing in many respects sometimes is moving it around rather than trying to take the holistic look and say, how do we solve this problem once and for all.

At the same time, I'm struck with an example that I had when I was at EPA. We suspended and cancelled the use of ethylene dibromide as a fumigant. What I'm struck with at the same time is if, for entirely different reasons, we weren't removing lead from motor fuels, we would have had a larger residue of ethylene dibromide and ethylene dichloride use because it was added to fuels to scavenge the lead and some of the other things.

There is an example that using the pesticide statute, you did this and what you did may well have been correct and appropriate, but you still were missing the bigger issue from a public health point of view because the stuff was in the air. There is an example of a statute having a narrow reach.

Senator BAUCUS. The question I asked was in what areas are present statutes insufficiently dealing with human health or ecological problems and its the category of where we're going perhaps too far?

Dr. MOORE. Being able, I think, to go after a problem wherever it may be gets into my media point. The other area I think that fits into taking a look holistically at a chemical that may or may not be a problem is, we continue to ignore indoor air by and large. Some of the major levels of exposure to certain chemicals results from our living and spending significant amounts of our time inside a home. That's where some of our major exposures are. I think that's something that probably needs to be looked at.

The other comment I would make specifically is in the area of the pesticide statute. I think the pesticide statute has tremendous encumbrances administratively to being able to do things that need to be done and being able to do them in real time.

Senator BAUCUS. Dr. Rall?

Dr. RALL. I guess for the Clean Air Act, I'd give it an A minus. I think some of the toxic emissions could be better. Superfund is really a C minus. It has good intention, not good execution. Needs rethinking. The problem is still there. Clean Water, pretty good. Toxic Substances, I think really should be reworked. I think we do need to pay more attention to the new chemicals, more attention to sorting out those that might be a problem and those that probably aren't.

Across the board entirely, the public deserves to see the health and safety data from any chemical that it is likely to be exposed to.

Senator BAUCUS. Dr. Colborn?

Mr. COLBORN. Just one thing. I agree with what Dr. Rall just said. I rank them the same way. I think TSCA needs a lot of work.

One of the things that very few of the laws encompass is the research to support the decisions that need to be made to determine the law and write the regulations, and the education and training that follows that kind of decision. We also need across the board consideration or prevention in every one of the laws addressing toxic chemicals. It would be so beautiful if we could just write what I call an omnibus prevention bill. It would be great. Each law needs working and they must not be reworked so that they are at cross purposes, which they have been in the past.

Senator BAUCUS. Another basic question I have is how can scientists help policymakers know when we have enough data or that toxicity is so great that there must be prevention or remedy?

You're scientists so you examine and you reach scientific conclusions. That's basically where it stops, if I understand you.

How can you help us or is there another group of people that need to be consulted to help us decide what statutes to write? This gets into lots of questions obviously. It's not just scientific. People say this is a problem and the TV stations and the newspapers print eat it all up, even though there is very little scientific basis for it. The people put pressure on us and ask us to respond.

From a scientific point of view only, what advice and guidance can you give us in helping us to know when we have enough scientific data that we should act?

Dr. RALL. I think there are two parts to the answer to that question. One is I think the regulatory agencies have to use the scientific community much more intensively than they have in a very open way to get the scientific advice on all of the particular problems they are facing, to get scientific advice as to what new problems ought to be looked at.

Parts of EPA are done very openly and parts are not. OSHA doesn't have much of an open system. This really should happen across the board.

Senator BAUCUS. How do we help encourage that?

Dr. RALL. As you rework the laws, indicate that you need open participation by as many academic scientists as is feasible. I think it works. It takes a little time.

Senator BAUCUS. I interrupted you. You were going to make a point?

Dr. RALL. I think by the same token, you ought to encourage Congress not to micromanage but to have oversight hearings generally on how things are going, what are the problems, what are the unsolved problems. There is no better way than to get any potential problems into the public arena for discussion.

Senator BAUCUS. Anybody else?

Dr. MOORE. Senator, I think science can deliver on identifying types of information that one would like to have on a chemical or on a chemical in a particular setting of uses. I don't think it would be prudent to suggest that every chemical that we have in this country needs $5 million worth of toxicity testing on it. Some may, some may even need more, but one can use our current scientific knowledge to define under what circumstances you want certain types of information. There is something I think science can deliver on.

As Dr. Rall pointed out, once you have such information, one has to have an ability to act. That's where I think he's also suggesting that agencies need to draw beyond their own employees in getting assistance in interpreting the significance of some of this information.

That also means acting in the face of uncertainty in some instances. If you've got a set of data that suggests there is a problem and you decide that you're not going to act, you have acted by default. I have no problem in acting in the face of uncertainty if the data is challenging enough.

Where I think we have fallen into a trap, that I also thing science can help resolve, is we act in the face of uncertainty and we make some conservative judgments because we're missing major

elements that we wished we knew and we want to make sure what we do is going to be protective.

There should be a premium placed, once you've taken such action, on encouraging the filling in those data gaps with real information where you had to make assumptions in the past. Right now, it's very chilling to get new information forwarded into an agency and get them to revisit a previous decision based on that new information. That's crazy to me. If you've got new information that can replace a guess because you didn't have information in the past, I think you should look at that new information and act appropriately. Somehow we've got to create an incentive system to be able to do that.

Dr. DAVIS. Let me just add that we are all here as scientists and some of us have had various experiences in the policy arena. We have a lot to be humble about when it comes to what science can and cannot do. The Times yesterday reported on a very toxic solvent. Data were reported by the National Toxicology Program, they were forwarded to OSHA and it fell between the cracks. Nothing has happened.

In the case of butadiene that Dr. Rall mentioned, data were reported more than 10 years ago that it caused cancer in animals. We now have evidence it causes cancer in humans. It fell between the cracks.

Those cracks, in my opinion, were not necessarily legal cracks; they were regulatory cracks. I am not so sure that the problem that you're posing is the whole problem. I'm not so sure the problem is that there is something wrong with the laws.

Sure we need to make changes with respect to certain aspects, but it would seem to me that a good faith effort to enforce the laws, to coordinate between all the regulatory agencies, would go a long way to solving many of the problems that we've highlighted here today. I'm reluctant to think that the solution to the problem is simply legal, nor do I think it's simply scientific.

The agencies have access to good science. We need to make certain they use it where it exists and where it does not exist that they come up with decision rules and estimates. The basic thrust of most environmental statutes has been preventive. That's why we're here before you. We want to prevent injury before it occurs and in that regard, it's up to the agency to figure out how to do that using the best information that they can. Whether you need a bunch of new statutes, I'm not so sure.

Senator BAUCUS. Let me ask another basic question. What advice do you have for us when the costs are fairly easily quantifiable, but the benefits are not? We know what the costs are of a certain regulation; we're a little less certain about the benefits. How do we deal with that?

Dr. RALL. I'd like to suggest that you very rarely know what the costs are.

Senator BAUCUS. Excuse me?

Dr. RALL. You very rarely know what the costs are. It is typically the estimates of the economic dislocation, the economic cost that are the worst in the series of estimates you need for effective risk management. That is, you have problems with the environmental levels and the measurement. You have some problems with animal

testing, problems with human epidemiology, but very often, the least reliable information is what the economic costs will be of a particular regulation.

David Dominic was at EPA some years ago and was faced with the problem of a chlorinated pesticide byproduct contaminating the fields of Louisiana and the cattle in Louisiana eating all of the pesticide and getting very high levels in their fat. He was faced with the problem of what to do, what should the action level be for this compound.

He asked his economists to estimate how many cattle would have to be killed if he picked one particular level, which is what he finally did, and the answer was that well, we predict that 4,550 cattle will have to be killed at a cost at that time of $2.275 million.

It turned out that farmers are kind of smart people. When they realized that by feeding these cattle good, clean feed for another six months, they were able to bring almost all of them into line with the current level and only three cattle were ultimately killed. What I'm saying is look very carefully at those economic projections.

Dr. DAVIS. Let me add another example. When vinylchloride emissions were first proposed, the industry came up with estimates that said they would have to shutdown a major segment of the industry and they argued against the control on emissions. A subsequent analysis by people at MIT showed that not only did they not lose money, they actually saved money because they discovered by capturing the fugitive emissions of vinylchloride, they were increasing their productivity.

This is a classic illustration and it doesn't always work in this way. What Dr. Rall has just said is quite true, it's far easier to quantify the costs but the same question you've asked us about what are the real risks and how can we show you what we've really done, has to be asked of the economists as well when it comes to these estimates of cost. It's a very trick business.

Senator BAUCUS. What about combinations of chemicals? With all our analysis on this particular chemical, then that one, what is the state of the art in combinations?

Dr. RALL. It's a serious problem. There have been studies at the National Toxicology Program using combinations of pesticides and combinations of typical water contaminants. It looks like they are at least additive and maybe even more. These studies are extraordinarily difficult to design. The statisticians pull their hair out because there are so many variables, but they have to be done even though it's going to be very expensive.

Dr. DAVIS. Let me suggest why, and that gets to the heart of the problem of the way we do risk assessment. As you're well aware, the way we do risk assessment today is to take the high dose of chemicals that causes cancer in animals and estimate down to the low dose to which humans are exposed typically. The reasons we do that have been described by Dr. Rall in his testimony.

What if the real problem is not that one chemical at a time, because none of us is exposed to one thing at a time, but these multiple exposures? In fact, there is good biological reason to think that is the case and in a series of studies done by Warren Porter at the University of Wisconsin Medical School, he has shown that ambi-

ent levels of exposure to common drinking water contaminants produce greater effects than additive.

So again, I think this is why Dr. Colborn and others have urged that we need to try to prevent pollution, reduce the amount of exposure, and there will be untold benefits and, at this point, unquantifiable benefits from such an effort. At the same time, in making such a plea, we also have to look seriously at what are the benefits of these chemicals as well as what other risks. Those are the kinds of decisions that the agencies have been asked by the laws that you've passed to make. I think we need to give them better resources to make those decisions and hope that they will do a better job.

Senator BAUCUS. Someone said—I think it was Ms. Ferris—we need more money for more research. That person also said that the money should be spent more efficiently. Where are the present inefficiencies? How can we be more efficient in the research funds we now spend to better address these questions?

Dr. RALL. The ugliest one is Superfund. I think that needs to be entirely rethought and I suspect we can do an adequate job for less money and some of that money can be used for the things we're talking about and there will still be some left over to spare.

Dr. DAVIS. The administrative and legal costs of the Superfund Program clearly have been indicted by a number of independent people in the government and outside of the government. I think in addition, it might be worthwhile to explore whether there might not be some economic incentives to give industry for providing more funds for testing.

At a time when resources are scarcer in the government and at a time when this President has announced a new technology policy to collaborate greater collaboration between the private sector and the Government, perhaps one special opportunity for that would be to provide incentives for industry to give money to the agencies with no strings attached and for them to get economic benefits for having done this in different aspects of the Tax Code, in which I am not expert, but would allow them to be paying for the tests that have to be done, but having the tests done independently. That would be one way to add resources which we think we really do need in this situation. No one is going to tell you we have enough testing information.

In terms of efficiency, I think efforts to use cell cultures, efforts to use short term tests, will reduce the costs. As you know now, long term bioassays are extremely costly. If we develop and validate short term tests, we'll ultimately be saving money. We need to do that.

We also need to get resources in from other sources, whether it's a green fee or a Superfund-like approach, I leave that to the wisdom of this committee, but I think it's worthwhile to consider appropriate vehicles to do that.

Senator BAUCUS. It strikes me there is an analogy here with health care reform. I know health care reform is very costly and there's a great need for more results research to determine whether certain procedures really are efficient or not. This country doesn't have good results research. I think there is a parallel here too.

In global health care, we're going to have to approach, I think, if not zero sum gain, at least some kind of global budget to force efficiencies and here too, we've made everything a priority, therefore, nothing is a priority and we're going to have to find some ways to put forth some priority-setting and efficiencies. The exposure research might be helpful and may be analogous to results research.

Does anybody have anything to add that should be added? Did anybody say anything so outrageous that must be addressed, whether a Senator or a panelist?

[No response.]

Senator BAUCUS. Thank you very much. You've been very, very helpful.

The hearing is recessed.

[Whereupon, at 12:50 p.m., the committee adjourned, to reconvene at the call of the Chair.]

[Statements submitted for the record and the *New York Times* articles referred to during the hearing follow:]

TESTIMONY OF THOMAS LOVEJOY, ASSISTANT SECRETARY FOR EXTERNAL AFFAIRS THE, SMITHSONIAN INSTITUTION

Good morning, Mr. Chairman and members of the Committee. As you have requested, I would like to provide a brief overview of what we know about trends in both domestic and global biodiversity. As l will emphasize throughout my remarks, what we know is limited by information that is incomplete or hard to compare. There is no doubt, however, that we are facing serious declines in the biological wealth of both our nation and the globe.

I will address three general areas in my remarks. My first task will be to outline briefly why biodiversity is considered important; in essence to answer the question: Why do we care if biodiversity is lost?

The second will be to describe some of what we know about loss of biological diversity within the United States. The facts in this situation should make clear that, while losses in tropical forests and coral reefs are of enormous significance, losses in the US should be considered significant as well.

Finally, I will discuss the kinds of indications we have concerning loss of biodiversity on a global level. In this regard, l would like to begin with one global statistic that [think captures much of our concern.

Based on well-documented recent estimates of the rate of species loss, it is possible that 10-20% of the species now living on earth will be extinct in 30 years. To put these numbers in perspective, losing 10% of all species over that period means losing 100 species per day, every day, for the next 30 years[1].

Why do we care?

Quite simply, we care because biodiversity supports life as we know it.

More specifically, we care because we depend to a great degree on both individual species and the products we derive from them, and on the enormous services that diverse ecosystems provide.

The examples range from the mundane to the remarkable. We feed ourselves from the sea, with many nations relying heavily on fish for important dietary protein. We rely upon breeding with wild relatives of many food crops for improved resistance to disease and pests[2]. A wild relative of corn that is both perennial and virvs resistant was recently found in Mexico, existing on only 6 hectares. Wild relatives of tomato have been used to greatly increase the sweetness and taste of cultivated varieties[3]. In fact, the shrinkage of plant genepools available to crop scientists may be one of the most immediate threats posed by the loss of biodiversity[4].

Increasingly, we not only feed ourselves from nature, but heal ourselves as well. The examples are legion, ranging from the well known case of tool and the Pacific yew, to lesser known examples ranging from anti-inflammatory and analgesic agents, antibiotics and insecticides derived from sponges, to substances isolated from shark cartilage that inhibit tumor growth.

The interest of international pharmaceutical firms in arrangements that allow them to engage in so-called "chemical prospecting" is instructive. The agreement between Merck and the Costa Rican national biodiversity institute is well-known. However, other arrangements are in the works that would make it possible to screen large amounts of biological material from rainforests for pharmaceutical properties.

Drugs from natural sources are not simply a speculative proposition, sought after by hopeful doctors. One estimate, from 1984, was that Americans spent approximately $8 billion per year for prescriptions with active elements derived from higher plants[5].

Biological diversity also represents an significant surce of knowledge about living systems. The accumulated learning contained within adapted organisms is of enormous value.

To the services and products from individual species, we must add those services provided by functioning, diverse, ecosystems. These life support systems are the basic foundation for much of life on earth, and their services are provided free of charge. These valuable benefits include[6]:

--Soil building: the creation of soil by the interaction of plants animals and microorganisms. Since the soils of an area the size of China and India put together -- nearly 11 percent of the earths vegetated area -- have been degraded so that their natural productivity is partially destroyed and their ability to support agriculture seriously reduced[7], this natural ability to regenerate soil is obviously crucial.

--Erosion control: the ability of functioning ecosystems to maintain ground cover to reduce soil loss and flooding.

--Nutrient availability: the cycling of nutrients from the air, through organisms and the soil and water. Two important examples are the close associations between plants and soil fungi, which enable plants to absorb far more nutrients than they could unaided, and the existence of nitrogen fixing bacteria in association with the roots of plants. These relationships make recent indications that some areas in Europe are experiencing mass local extinctions of fungi[8] more relevant.

--Carbon storage: An enormous volume of carbon -- a central element in global warming -- is stored in existing forests,

both in standing trees and in fallen leaves, litter, dead and down trees and underground root materials. Other systems such as grasslands are important carbon sinks as well.

--Hydrologic cycling: the ability of forests, grassland and wetlands to regulate streamflow, filter water and control flooding.

--Pest management: the existence of natural mechanisms that control pests, ranging from genetic diversity that increases resistance, to species that control pest populations through predation.

Healthy ecosystems also support the individual species on which we rely for the types of products and services I have just described. No natural species exists in isolation -- rather it is supported by a system that provides it with appropriate food, shelter, and physical conditions. Destruction of this supporting system will result in the destruction of the individual elements we value directly.

What is happening to biodiversity in the US?

As I begin my discussion of biodiversity trends, I would like to restate a key point. There is ample evidence of disturbing trends in this nation's, and the world's, biodiversity. However, since we have not systematically looked for these patterns, trends or linkages, we are perceiving the trends by examining many individual, sometimes anecdotal, pieces of evidence. Little comparable longterm data exists for most species, and even less for habitat types and ecosystems.

Federal agencies collect important elements of an overall picture. Agencies such as the Fish and Wildlife Service study particular species and habitats such as waterfowl, breeding birds and wetlands, and conduct valuable research on ecological functioning. The National Marine Fisheries Service and EPA, as well as other agencies, also undertake significant research and data-gathering. Land managers collect a variety of data concerning the resources on their lands.

Outside parties also contribute to the overall, yet incomplete picture. The Nature Conservancy (TNC) established and now partially supports the 50-state Natural Heritage network, widely considered to be the most comprehensive and ambitious national system for organizing and managing biodiversity data. Yet I am certain that even TNC would readily admit that the Heritage System would need to be greatly augmented to create a truly robust national view of the condition of our biological resources.

The following facts and statistics illustrate important elements of what we know about trends in US biodiversity.

--In late 1991, the American Fisheries Society classified 214

native, naturally spawning stocks of Pacific salmon, steelhead, and sea-run cutthroat trout as at high or medium risk of extinction (101 and 58, respectively) or of special concern[9]. This puts the current controversy over listing of small numbers of salmon in the Columbia River system into sobering perspective.

--A similar, earlier review by the AFS found that nearly 113 of the native freshwater fishes in North America north of Mexico are similarly at risk[10].

--One in every ten North American freshwater mollusc species has become extinct in this century[11].

--The number of species formally listed as threatened or endangered continues grew to approximately 755 species by the end of 1992. In addition, the federal government has agreed to expedite listing review for several hundred additional species over the next few years.

--More than half of wetlands in the lower 48 states have been converted, and losses, although diminishing, continue. Well over one-third of all federally listed species use wetlands at some point in their life cycle; and an estimated 80% of the nation's coastal fisheries are dependent upon wetlands[12]. Wetlands are also critical to waterfowl; statistics indicate that many species are far below their long-term levels. For example, in Canada, black duck populations are down more than 50% from 1955 levels, and breeding mallard and pintail populations in western Canada are down 50% or more[13].

--Approximately 90% of the old-growth timber in the Pacific Northwest has been logged or lost to development. Since there is mounting evidence that large numbers of species utilize old-growth, it is becoming increasingly clear that many species in addition to the well-known spotted owl and marbled murrelet face difficulty if these losses continue.

--Concern is growing over declines in fish that are valued for commercial purposes as well. More than half of US fisheries stocks are fully- or overutilized; only 13% are underutilized. (As an illustration of how little we know, there is insufficient information on about 1/3 of stocks to determine utilization levels.) For example, New England groundfish (for example, cod and flounder), the most valuable component of the region's fishery, are down to 45% of their long term potential. Atlantic bluefin tuna, which can bring as much as $67000 per fish, are down to 10% of what they were 20 years ago[14].

--A recently completed study of coral reefs in the national parks and national marine sanctuaries in south Florida found declines in biodiversity in all areas studied. The minimum loss of coral species was 13%, and the maximum was

33%. The declines in the amount of living coral ranged from 4% to 10% per year[15]. If these loss rates continue, there are some reef areas that will be without coral in ten years.

--What is particularly striking about these figures is that they are from protected areas. Parks and marine sanctuaries are areas we have, as a society, set aside with an assumption that they could be maintained intact. One should not draw a conclusion that the managers of these areas are not doing their job, however. Rather, it is clear that we must incorporate a broader ecosystem perspective in our management if we are to truly understand the threats to such valuable systems.

--Finally, a small, but telling example from the heartland of the US. In Seneca County, Ohio, there are sufficient published records for us to estimate that there were 82 species of butterflies in 1890. In 1960, that figure was 62. In 1989, it was down to 48.[16]

What is happening to biodiversity globally?

Discussions of global biodiversity losses are of necessity at a much lower level of detail, since even the incomplete information gathered in the US is far better than that available in many areas of the world. However, the following are useful in sketching out the kinds of information that has generated an extraordinary level of concern in both the international scientific and diplomatic communities over this issue.

--Tropical forests: In 1979, it was estimated that approximately 56 percent of the world's tropical forests remained, and about 1% was being lost per year. By 1989, less than half remained, and the rate of loss had increased to 1.8% per year[17].

--Significant amounts of coral reefs, which rival tropical rainforests in diversity, have been destroyed or damaged off the coasts of 93 nations. These systems, which collectively cover only 0.17% of the oceans area (about equal to the size of Texas), have perhaps 25% of all marine species[18].

--11 percent of the world's bird species are endangered[19].

--From the 1940s to the 1980s, population densities of migratory songbirds in many forests in the eastern US dropped by 50% to 70% 20, and there were many local extinctions[21].

--About 20 percent of the world's freshwater fish are either extinct or in dangerous decline[22].

--Many nations in Africa have lost significant amounts --50 to 90% -- of their original savanna/grassland, dry forest, and wet forest ecosystems[23].

--30-50% or more of known mammals, birds, fish, reptiles and amphibians in several OECD nations are threatened[24].

Conclusion

Rather than coming here simply to frighten you, or to merely recite a litany of statistics, I would like to leave you with several thoughts about what I believe our Nation, and the world, can do to respond to the darkening picture I have just sketched for you.

--**We can ensure that we clarify the picture.** Efforts to increase the amount of biological information we gather, and to make what we have more accessible and comparable, are a critical first step. Increasing our understanding of how natural systems work--how the pieces we inventory interact with each other -- is also crucial.

--**We can use what we know to make management decisions.** We should recognize that our present conservation and management approaches are incomplete. We focus on a few elements -- species that are already in danger of extinction, wetlands, and the like -- and ignore much of the rest. We focus on species primarily when they are in danger -- not before the point when our options are seriously reduced. We focus on single pieces of land, and ignore the connections between those lands and their surroundings. We must begin to structure our management decisionmaking to take account of whole ecosystems, and to avoid declines in species and ecosystems, rather than responding to those declines after the fact.

Notes

1. Based on E.O. Wilson's estimate of 10-20% loss over 30 years, and a rough estimate of approximately 10 million species. Thus, losses could be in the range of 1 million species. With roughly 10,000 days in 30 years, losses are roughly 100 per day. Wilson's estimate is contained in Wilson, E.O., The Diversity of Lije, (Cambridge, MA: Belknap/Harvard University Press, 1992), page 278.

2. Iltis, Hugh, "Serendipity in the Exploration of Biodiversity: What Good Are Weedy Tomatoes?" in Wilson, E.O., Biodiversity, (Cambridge, MA: Belknap/Harvard University Press, 1992), page 103.

3. ibid, pages 101-103

4. Council on Environmental Quality, "Linking Ecosystems and Biodiversity", in Environmental Quality. The 21st Annual Report of the Council on Environmental Quality (Washington, DC: CEQ, 1991), page 147.

5. ibid, page 149.

6. ibid, pages 149-151, unless otherwise cited.

7. World Resources Institute, World Resources 1992-93, (New York, Oxford University Press, 1992), page 111.

8. Wilson, page 258.

9. Nehlsen, W., I.E. Williams, J.A. Lichatowich, "Pacific Salmon At The Crossroads: Stocks At Risk From Oregon, Idaho, And Washington" in Fisheries 16:4(4-21), 1991.

10. Master, Larry, The Imperiled Status of North American Aquatic Animals, in Biodiversity Network News, 3(3)1990.

11. ibid

12. Department of the Interior, Wetlands Stewardship, (Washington, DC: DOI, 1992), page 2.

13. Government of Canada, The State of Canada's Environment - 1991 (Ottawa, Minister of Supply and Services, 1991), page 6-13.

14. Council on Environmental Quality, "Fisheries and marine Mammals", in Environmental Quality. The 23rd Annual Report of the Council on Environmental Quality (Washington, DC: CEQ, 1993), page 101.

15. Dr. James Porter, University of Georgia. Personal communication.

16. ibid

17. Wilson, E.O., page 273.

18. Weber, Peter, "Reviving Coral Reefs" in State of the World 1993, (New York: Worldwatch Institute, 1993), page 42.

19. Wilson, E.O., page 255.

20. David Wilcove, Environmental Defense Fund, personal communication.

21. Wilson, E.O., page 256.

22. Wilson, E.O., page 256.

23. World Resources Institute, World Resources 1990-91, (New York, Oxford University Press, 1991), page 306.

24. Organization for Economic Cooperation and Development, Environmental Indicators, (Paris: OECD, 1991), page 41.

STATEMENT OF DR. THEO COLBORN, SENIOR FELLOW, W. ALTON JONES FOUNDATION AND WORLD WILDLIFE FUND

I am Dr. Theo Colborn, a senior fellow at the W. Alton Jones Foundation, presently on sabbatical from the World Wildlife Fund, where I coordinate the Toxics and Wildlife Project.

I am especially grateful for this opportunity to speak to you today because it is important that you understand a very serious and largely unexplored environmental health problem. In brief, I and many of my colleagues estimate with confidence that exposure to man-made chemicals has damaging effects on the endocrine, immune, and nervous systems of wildlife and humans, not principally in the generation exposed to the chemicals, but in that generation's offspring.

Since time is short, I have selected three broad points that I want to make to you, and then ask that my more complete statement be inserted in the hearing record along with the first chapter of a recent book which I edited entitled "Chemically-Induced Alterations in Sexual and Functional Development: The Wildlife/Human Connection."

First: We have been missing the insidious health effects of manmade chemicals, effects that are not expressed as obvious birth defects or cancer.

Seven years ago I began compiling an extensive data base on the health of wildlife and humans in relation to their exposure to these chemicals and discovered that many of these synthetic chemicals can invade the body and in the case of a pregnant animal enter her womb and change the course of development of her baby. We now have evidence from wildlife, laboratory animals, and the human experience that chemicals of this nature can alter the construction of the developing endocrine, immune, and nervous systems of embryos, fetuses, and breast feeding offspring. Most often, these effects are not expressed as obvious birth defects, but more often in terms of loss of function of these systems, so that the individual does not reach its fullest potential.

We missed the insidious nature of these chemicals first of all because the effects are not realized in the exposed adult, the mother, but in her offspring. And oftentimes, the full manifestation of the effects are not realize until the offspring reaches adulthood, for example, when suffering from the loss of fertility. Our testing protocols were not designed to catch the results of this insidious invasion of the body.

Let me give you three examples of what I mean:

The first involves birds. Male gull chicks from the Great Lakes and the west coast have been found with female sex organs (ovaries and oviducts) and female chicks have been found with

extra oviductal tissue. Similar conditions were induced in the laboratory by feeding sparrow hawks a DDT substitute, dicofol. When the males grew up, they were reproductively incompetent and behaviorally submissive as well.

The second involves laboratory rats. If you expose a pregnant rat to only one meal of dioxin on day 15 of her pregnancy, her male pups become demasculinized and feminized and not all the effects are measureable until the rats reach adulthood when a reduction in sperm count is one indication of the problem.

The third involves humans. A sample of babies born of women who ate two to three meals a month of Lake Michigan fish for at least six years preceding their pregancies gave birth to babies that were lighter in weight, had smaller crania, and experienced shorter gestation than babies born in the same communities of mothers who did not eat fish. These children had cognitive, motor and behavioral deficits at birth and exhibited short term memory problems at age four, as well as still remaining smaller in stature than their counterparts.

While these examples might appear on the surface to be very different, they are all driven by a combination of three basic factors: 1) the exquisite sensitivity of developing organisms to chemical signals; 2) the reality that many man-made compounds are capable of disrupting those signals; and 3) the unfortunate truth that we have spread these biologically active chemicals throughout the environment, either by design, ignorance, or negligence.

Second: We need to take these effects as seriously, if not more seriously, than cancer.

Almost two years ago I convened twenty-one experts to focus on the problems of maternal transfer of toxic chemicals to the offspring. They were to reach some consensus about its nature and importance. The results of their thinking and conclusions have now been published by Princeton Scientific Publishing Company in a book entitled "Chemically Induced Alterations in Sexual and Functional Development: The Wildlife/Human Connection". I would like to leave this book with you and also quote from its conclusions. These scientists stated with certainty that:

"A large number of man-made chemicals that have been released into the environment ... have the potential to disrupt the endocrine systems of animals, including humans."

They proceeded to estimate with confidence that:

"Some of the developmental impairments reported in humans today are seen in adult offspring of parents exposed to synthetic hormone disruptors released in the environment."

And "Unless the environmental load of synthetic hormone disruptors is abated and controlled, large scale dysfunction at the population level is possible."

Since that meeting, a great deal of new evidence has been generated to support the above statements. In light of what we know today, I plead with you to consider seriously the importance of addressing non-cancer transgenerational health effects in every aspect of legislation your committee intends to undertake.

Third: Our regulatory system is not geared to cope with chemicals of this nature.

Most importantly, upon a close look at many chemicals freely released in the environment, one finds out that the testing which has been done has focussed on screening them for their acute toxicity, their tendency to cause mutations and cancer, and their obvious severe effects on the nervous system. Though little action has been taken on industrial chemicals, our concern about cancer and gross birth defects has likely kept a lot of bad pesticides off the market and restricted the use of others. On one hand we have to be thankful for our concern over cancer, it has prevented exposure to many chemicals. But on the other hand, it has got us in a real pickle. By focusing our limited public health research and regulatory resources on cancer we have overlooked serious non-cancer health effects. When we combine this with hubris on the part of the chemical industry, reluctance on the part of agencies to accept and act upon evidence of damage, and our lack of knowledge about the less obvious but devastating, non-cancer health effects of chemicals it is easy to understand how we got into this predicament. We cannot let this continue if we are going to be able to cope with new products that in some cases are deliberately more potent so that less can be used.

We are short on successes because we have an appalling history of failing to take the appropriate action when evidence of damage is presented. We have regulated too late and, as in the case of DDT and others, for the wrong reason. And in many cases the chemical industry has taken advantage of the fact that under current laws chemicals must be shown to cause harm, leaving the responsibility to the federal agencies or the victims to prove damage.

In your invitation letter, you asked me to address three questions. Let me try to give you responses with a special emphasis on the non-cancer health effects of exposure to toxic chemicals.

(1) How much have we done to protect public health and the environment from environmental exposure?

Mr. Chairman, for days I have suffered over how to give you an honest answer about how much we have done to protect public health and the environment from exposure to toxic

chemicals. I guess one could call the restrictions on the use of DDT in 1972 a success, even though that was a full twenty-two years after scientists successfully discovered that DDT was a potent estrogen-like compound that caused egg shell thinning and prevented male chickens from reaching sexual maturity. These developmental health warnings from wildlife and laboratory animals were ignored until EPA Administrator William Ruckleshaus was informed that DDT might be a human carcinogen. The threat of cancer triggered the action on DDT, although the action did not ban the production of DDT at the time.

Similar success stories can be listed here for dieldrin, chiordane, toxaphene, and the PCBs to mention a few. But, as I noted earlier, we have often been looking for the wrong kinds of harmful health effects. In deciding the safety of chemicals, a broad variety of potential health effects -- including non-cancer effects -- must be considered.

(2) What is the nature and extent of the remaining environmental health problems?

Unfortunately the list here is long. A few fundamental issues stand out however, and I will focus my attention on them.

New science and technology now allows us to look deep into cells and to measure chemicals at parts per trillion or less giving us extraordinary windows into the working of the innermost parts of cells, into the ways that cells communicate with one another, and into the remarkable workings that shape an embryo and fetus into a full-grown organism -- be it man or whale or eagle.

These new windows are raising completely new questions about the toxic impact of chemicals. Not too long ago we were able to see only the grossest birth deformities or cancer. Our regulatory structure reflects this -- laws written to cope with what was visible -- with what we knew at that time. This new science makes our old approaches inadequate.

For example, we know today that a developing organism is exquisitely sensitive to its chemical environment. Indeed, it is its natural chemical environment that tells it how to grow. Scientific research demonstrates unequivocally that the slightest shift in signals among cells in the developing embryo, fetus, or nursing offspring can change the course of development of that individual. Chemicals produced within the mother and the developing offspring control this process. The very chemical nature of this control, however, makes this process vulnerable to interference from manmade chemicals that enter the system.

Stir man-made chemicals into this natural process, and you change it. The effects do not lead, necessarily, to visible birth defects, but can change the fUnctions of vital systems, like the endocrine, immune, and nervous systems, and lead to losses in human potential. And most insidiously, many of the effects are not

manifested until the individual reaches adulthood even though exposure took place in the womb.

(3) Are there trends in environmental health that cause you concern or lead you to believe that we have addressed most of the problem?

Mr. Chairman, I am sure that you realize by now that I see trends that cause me deep concern. In closing I would like to offer a few examples, both from wildlife and humans, that illustrate the scope and scale of what we face.

For instance, wildlife biologists have discovered, but do not know why, all the top predator fish and herring gulls dependent upon food from the Great Lakes that they have examined have abnormally large thyroids and unusual thyroid hormone production. Nor do they know why most of the top predator fish in the Lakes cannot reproduce, or why most of the top predator male fish begin to mature precocially but never reach sexual maturity.

They want to know why female-female pairing in herring gulls is associated with certain chemical exposures and why only female double-crested cormorants experience a common birth defect when exposed similarly.

The problems are in no way limited to the Great Lakes or fish and birds.

Marine biologists are puzzled by the dramatic pattern of seal, dolphin, porpoise, and whale die-offs in the Northern Hemisphere, and the immune system problems associated with the die-offs -- widespread die-offs that only commenced in 1987. In each case, high concentrations of contaminants have been found in the damaged populations. The marine mammals seem to be the environmental sponges collecting these chemicals as they find their way to the oceans -- long after the restrictions went into effect.

Psychologists are trying to find out why rats fed a diet of Lake Ontario salmon for twenty days can no longer cope with stress. They want to know which of the many chemicals found in the fish are causing the problem. They also want to know why pups exposed only to the breast milk of the hyperreactive rats behave the same way -- pups that were never fed fish.

Human epidemiologists are wondering why, since 1938, there has been an approximate 50% reduction in sperm count worldwide. Experts hypothesize that this is the result of exposure to estrogen-like chemicals in the womb interfering with the proper development of the male endocrine system.

All of the above and many similar examples are of concern to

me and my colleagues and in our opinion require addressing. We have just begun to open the door of discovery concerning the non-cancer health effects of the synthetic chemicals that in the last fifty years have become an integral part of our life. We simply cannot walk away from the evidence.

Dr. Colborn earned her PhD in zoology with a distributed minor in epidemiology and toxicology at the University of Wisconsin, Madison. Her field research was at Rocky Mountain Biological Laboratory, Gothic, Colorado. Her MA in freshwater ecology at Western State College of Colorado; and her BSc in pharmacy at Rutgers University. She was a Fellow at the Office of Technology Assessment before moving to the Conservation Foundation, where she provided the science for the book "Great Lakes, Great Legacy?" released in 1990 jointly with the Institute for Research and Public Policy, Ottawa. Dr. Colborn has consulted for Environment Canada, Health and Welfare Canada, the International Joint Commission, USEPA, the Agency for Toxics Substances and Disease Registry (ATSDR), and the UNEP Marine Mammal Task Force, to mention a few.

She is a three-year recipient of a Fellowship from the W. Alton Jones Foundation and was the 1991 recipient of "The National Water Alliance Award for Excellence" in protecting the nation's aquatic resources. She recently edited a book entitled "Chemically Induced Alterations in Sexual and Functional Development: The Wildlife/Human Connection".

LAUCH FAIRCLOTH
NORTH CAROLINA

United States Senate

WASHINGTON, DC 20510-3305

April 15, 1993

Honorable Max Baucus
Chairman
Committee on Environment and Public Works
SD-456 Dirksen Senate Office Building
Washington, DC 20510-6175

Dear Max:

I attended the hearing you held on March 24, 1993, focusing on the question of how we assess environmental risk, and found the presentations to be very informative.

Like you, I believe it is crucial that we rely upon good science as we develop environmental policy aimed at protecting human health. I understand that good science consists of studies that have been peer reviewed by other scientists. As a matter of fact, several of your witnesses stressed the importance of peer review as a prerequisite to reliance upon a study for use in developing public policy.

Dr. Theo Colborn cited a Lake Michigan study done by Jacobsen, et al. In citing this particular study, Dr. Colborn failed to mention that the study's results have been widely questioned. In this regard, I have attached three reports that should be considered in evaluating the validity of the Jacobsen study and the conclusions drawn from it.

I would appreciate your addition of this information to the record of the hearing held on March 24, 1993.

Thank you for your attention to this very important matter.

Sincerely,

Lauch Faircloth

LF:kl

REVIEWS:

1) Fein GG, Jacobson JL, Jacobson SW, Schwartz PM, Dowler JK. Prenatal exposure to polychlorinated biphenyls: effects on birth size and gestational age. J Pediatr 105:315-320, 1984.

2) Jacobson SW, Fein GG, Jacobson JL, Schwartz PM, Dowler JK. The effect of intrauterine PCB exposure on visual recognition memory. Child Development 56:853-860, 1985.

3) Jacobson JL, Jacobson SW, Humphrey HEB. Effects of in utero exposure to polychlorinated biphenyls and related contaminants on cognitive functioning in young children. J Pediatr 116:38-45, 1990.

1. Fein et al.

These three papers report findings for all or portions of the same study population, originally identified in 1980-81 in the region of Lake Michigan. The "exposed" population and controls were included on the basis of maternal self-reported diet histories of fish consumption, but exposure status was later reclassified for some analyses on the basis of cord serum PCB levels. That reclassification resulted in a large shift in the distribution of subjects by exposure, i.e., the number considered to be "exposed" went from 242 to 75 when exposure was redefined from dietary histories to cord PCB level, while controls went from a total of 71 to 166.

The first concern with these reports lies with the marked differences that are evident between the groups (unexposed and exposed). Table I shows that the groups, when classified by fish consumption, differed significantly not only in alcohol, caffeine, and cold medication use but also in the proportion who experienced spontaneous birth. Those with spontaneous births continued to be overrepresented in the control group when exposure was reclassified by cord PCB level. Because the number of non-spontaneous deliveries is higher in the exposed group than would be expected by chance alone, and cesarean section births are frequently related to adverse birth events which might place the infant at increased risk, it appears that the groups (by either exposure definition) were not equivalent with regard to risk status of the infant. One possible explanation would be an association between PCB exposure and rate of non-spontaneous births, but this does not seem logical and was not further explored by the investigators. Another possible explanation would be a selection bias which allowed more "high risk" deliveries into the exposed group, but the source of such bias is not evident from the information provided. The end result, however, is the strong suggestion that the groups differ in infant risk status. The investigators attempt to control for this factor by adjusting their analyses for type of delivery, but

serious group differences cannot always be overcome simply by the use of a control variable. The control variable itself (presumably grouping all non-spontaneous deliveries together) may have been too crude to make the adjustment meaningful.

The results could also have been influenced by a relatively small number of infants with significant problems, who remained in the exposed group by both definitions. Retention in the sample of a twin and infant with respiratory distress, as mentioned in paper #2, suggests that infants with obvious risk factors for the outcomes of interest may have been present in the sample, although the exposure status of these infants is not stated.

The investigators attempted to control for differences between groups by including potential confounding variables in the multivariate analyses. They followed the same strategy in all analyses by first testing for an association between the potential confounder and exposure status and keeping the confounder in the analysis if an association existed. This raises another concern. Although this approach is an accepted means of identifying potential confounding variables, it frequently results in omission of important variables that are well recognized as potential confounders based on scientific knowledge. A more appropriate strategy, in my opinion, is the retention in the model of variables with known effects on the outcomes of interest. For example, it would have been wise to keep smoking, alcohol, and maternal age in all multivariable analyses related to pregnancy outcomes. The omission of smoking data from any of the analyses presented, regardless of the fact that this variable did not meet the designated criteria, could have affected the results.

2. SW Jacobson et al.

This study looked at infant recognition memory, a form of short term memory, using a test that has been shown to be sensitive in discriminating several conditions related to adverse neurological function. The number of infants in this study was relatively small (123 when classified by fish consumption, only 81 when classified by cord PCB level), but the findings indicate an association between exposure and test results by both exposure definitions. The investors' report that the cord serum PCB level was a stronger predictor of performance is difficult to confirm, since the study groups for each analysis were not equivalent. The report does provide evidence, however, that the performance of the groups classified as exposed and non-exposed differed significantly. Whether the difference was related to PCB exposure or to initial group differences discussed above is unknown.

There are a few inconsistencies and weaknesses in this report. A dose-response relationship is displayed in Figure 1 which divides the groups on cord serum PCB levels of 1.1 and 2.2

ng/mL. However, paper #1 clearly stated that the laboratory level of detection for serum PCB was 3.0 ng/mL. Quantification of PCB exposure is therefore unclear.

Despite very small numbers, the investigators attempted to follow Needleman's strategy of looking at the relationship between exposure status and position within the tails of the distribution for test scores. Their findings of an increased probability for exposed infants to fall among the lowest test scores may again be related to initial group differences because this approach was carried out without making adjustments for any of the potential confounders.

Finally, the investigators leap to the conclusion in their discussion that their data support the premise that deficits may emerge at a later age when they were not necessarily evident at birth. Their study neither supports nor disproves this premise since the visual recognition functions tested at 7 months were not addressed at birth. Although the deficits may have become apparent when the child grew older, they may have existed at birth but were not detectable by current methods of examination.

3. JL Jacobson et al.

The final report looks at the same group of children at 4 years of age, using a battery of standard neurobehavioral tests. There are several positive features of this study. Apparently very few children were lost to follow-up, although data were not available for all variables. The test battery was standardized and covered a wide range of functional domains; this is the most desirable approach when investigating a potential neurotoxin. An excellent inclusion was the administration of a vocabulary test to the mothers, thus allowing for control of native intelligence factors. In line with the discussion under paper #1, it would have been desirable to keep maternal vocabulary score in all final models for analysis because of its importance. This was not done, however, after the investigators ruled out maternal vocabulary as a confounder.

The pattern of test findings is interesting, and could be interpreted as consistent with the pattern expected as a result of toxic exposure. Memory performance seemed to be selectively associated with exposure, while motor performance was spared. Selective deficits, as the investigators mention in their discussion, can suggest a selective effect of a neurotoxin on the central nervous system. Normal performance in other functional domains supports the argument that the positive findings are not likely due to confounding by differences in general intelligence factors between the groups. A caveat is in order, however. The presentation in Table 1 of several significant differences between groups on memory tasks can be misleading if the reader is unaware that these variables are not independent. As indicated in the text, the composite scales are largely influenced by performance on the two memory subtests.

Having established that memory is the functional domain that has been consistently demonstrated by this research group to be associated with their definitions of PCB exposure (Papers #1 and #2), it is important to note the lack of consistency of this finding with findings in North Carolina of Rogan et al. who identified an association with psychomotor performance in infants. This inconsistency weakens the evidence for a link between PCB exposure and neurobehavioral deficits. If the study populations differed in dose, an overlap might have been expected, but some functional domains should have been similarly affected.

Despite positive findings on a test related to memory at 7 months (paper #2), no further analyses are presented regarding that group in the study of children at age 4. While the opportunity apparently existed for a longitudinal examination of data for that subgroup, it was not undertaken. The results would have been strengthened if it had been demonstrated that the same children identified as having deficits at 7 months continued to be impaired at 4 years.

A curious omission in this study was the failure to report differences between groups as defined by fish consumption. The investigators do not state why they departed from the previous analysis strategy. Also, dose-response histograms again divide groups based on cord serum PCB levels less that 3 ng/mL.

SUMMARY

These studies do not present strongly convincing evidence for a relationship between prenatal PCB exposure and childhood CNS deficits. The major problem is the large apparent difference between exposure groups when they were originally defined and the potential influence of those differences on findings, regardless of statistical attempts at controlling confounding. These differences remained a factor throughout all analyses for the same cohort. Another problem is the lack of consistency in specific findings between investigations of exposure to PCB. A number of other minor inconsistencies went without explanation by the investigators.

Review of Michigan Studies of Children with Polychlorinated Biphenyl (PCB) Exposure and Comparison with Similar North Carolina Studies

Submitted: **Genevieve M. Matanoski MD, Dr.P.H.**
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Introduction

The study of the risks to newborns and children from polychlorinated biphenyls (PCBs) in Lake Michigan fish was conducted by S.W. and J.L. Jacobson, G. Fein and others based on a sample of newborns in 1980-81. The results of the study have been reported in several papers, five of which have been reviewed for this report. In addition, six papers which describe the North Carolina study of newborns whose PCB exposure is related only to maternal levels of the chemical and not to a known source have been reviewed for comparison of results. The neurological tests administered to the children were similar in the two populations. Many of the confounding variables were similar. But the design of the studies and the source of PCB exposure were different.

Study Design and Sample

A review of the Michigan study raises a number of concerns regarding the study design and the sample selection procedure employed. While the design is reported as if it were a prospective study, the actual method of sample selection is not truly prospective. As described in the most recent paper (5), 8482 women delivering infants in four Michigan hospitals (1980-81) were surveyed regarding Lake Michigan fish consumption both during pregnancy and in the past. From this population, women were classified as PCB exposed or non-exposed based on

their total fish consumption. Women who had "contaminated fish consumption" of at least 11.8 kg. during any 6-year period were included as exposed. A small sample of 71 non-exposed women were included for comparison.

This selection procedure raises a number of questions regarding the validity of this population sample of newborns. First, because the infants were delivered before the survey was administered, the outcome was known prior to recruitment into the study. This may have influenced both the mothers' willingness to participate in the study as well as their responses to survey questions. The authors report that "ninety percent of the infants designated at medical risk by hospital staff were among the offspring of fish-eating women, and all but one of their mothers agreed to participate". Infants at medical risk are usually those who are born non-spontaneously, are small or have an abnormality. The above statement suggests that these mothers may have had differential recruitment into the study. Furthermore, since the ratio of exposed to non-exposed individuals was 3:1, any participation or response bias between the groups will be magnified.

A second area of concern relates to the selection of the exposure groups. In order to be included in the exposed group the mother must have a minimum of 11.8 kg of "contaminated-fish consumption" in a six year period. The non-exposed group consisted of women "who did not consume these fish". This results in a comparison of only the extremes of possible exposure. It would be difficult at best to draw general conclusions based on an analysis of these extremes since one is only seeing the outlying ends of the continuum of possible exposures. For example, any attempt to draw a dose-response relationship or a regression line using only these extremes and no intermediate exposure data becomes problematic.

The exposed population also exhibited a number of unusual group characteristics unrelated to PCB exposure which supports the idea that a selection bias may exist. For

example, this group showed a higher rate of non-spontaneous births, a greater number of male births and large differences in alcohol, coffee, and medical drug consumption. With the recognized high correlation between smoking and alcohol consumption, there should have been differences in smoking histories as well, although they were not reported.

Finally, based on six twin sets in a population of 313 infants, the twinning rate in the total population would be 19.5/1000 pregnancies whereas in the Rogan et al. studies the rate is only 6.5/1000 pregnancies. Since twins are considered high risk infants, are usually small for gestational age and frequently have abnormalities, it would be important to know into which group they fell. Exposure to PCBs via fish consumption is clearly not responsible for the difference in twinning rates between the two studies. This observation again suggests that the sample may have an inherent selection bias which would cause problems in interpreting the results.

Correlations of PCBs in Various Samples

Early reports from this study indicated the correlations of fish consumption, a proxy measure of PCB exposure, with laboratory tests of PCB body burdens (1,2). However, there is no correlation between maternal fish eating and umbilical cord blood level of PCB which is considered to be the most accurate measure of transplacental exposure. Thus, the data from the Jacobson study does not show that fish consumption by the mother is related to fetal PCB exposure.

A number of other inconsistencies exist between the Michigan and North Carolina studies. The Michigan study found positive correlations between fish-eating and maternal sera PCBs and levels in milk although the reported significant correlations are not high (6). Conversely, the North Carolina study showed no relationship between PCBs in maternal sera and sport fish consumption (6). Furthermore, the latter study did show that maternal sera levels were strongly

related to maternal age, parity, previous breast feeding, occupation and alcohol consumption (6) while the Michigan study only reported age as a correlate of maternal sera PCB levels. (1) This seems unusual since any factors which influence fat mobility such as breast feeding should lower the level of PCBs in sera. The fact that the data relating maternal sera levels of PCBs and fish consumption in the North Carolina and Michigan studies are not consistent leads to questions.

Laboratory Measurement of PCBs

The best measure of infant exposure to PCB in utero should be the levels in cord blood. While the amount of PCB transferred to the newborn varies throughout pregnancy due to weight changes in the mother, alcohol consumption and other factors, these cord blood levels probably are most representative of the infants exposure during fetal life. However, observed levels of PCB in cord blood are low. (1,6) The Michigan study used Aroclor 1260 as the standard the for measuring cord blood levels of PCBs. This standard has a quantifiable lower limit of 3 ng/ml. Despite this degree of sensitivity 66 percent of the samples are not quantifiable below this level even though they are detectable. (1) This means that it would be difficult to reliably quantify cord blood PCBs below 3 ng/ml. Yet the studies of neurological effects by the Michigan group repeatedly look at dose response relationships based on cord blood levels below 3 ng/ml. (4,5) (This will be discussed further in relation to outcomes).

All of the measures in the population are log normally distributed. Despite this fact, the authors have made some comparisons using means and medians as well as log means. It is difficult to determine how this change in measure may have altered some of their decisions since it is not mentioned in relation to PCB levels until the most recent paper.

Outcomes and Confounding

The first report of outcomes indicates that infants were smaller by weight and head circumference in the infants designated as exposed to PCBs by either maternal fish consumption or cord PCB levels. (3) The results, however, differ depending upon the method used to measure exposure. One might expect this since they were not correlated with each other. The results of the Ballard Test for Fetal Maturity only showed significant differences between exposed and non-exposed when the "soft" exposure measure of fish consumption was used. There were no differences in measured maturity when the cord sera was used. Most subsequent reports used only cord blood PCB levels as the exposure measure.

The risks of developmental abnormalities based on exposures to PCB have been controlled for different variables depending on the exposure measure used. The authors used the empirical cut off point of p of less than 0.10 in deciding which variables required control. Thus, if a "control variable" was not significantly different at the p less than 0.10 level, the variable was no longer controlled. A potential problem exists when using this criteria in that the p values also are influenced by the number of cases available for study. Many of these "control variables" are known to be associated with fat metabolism which could be related to PCB levels in sera as well as related to fetal outcome. Therefore, they should have been included in each model for adjustment and not eliminated solely on the basis of an arbitrary value of a statistical test.

The authors also have been rather arbitrary in their decision to include certain "control variables". They report that males occurred more frequently among the exposed group, yet, despite the fact that there is no logical reason to believe that the infant's sex is related to PCB exposure, they have controlled for this variable in examining the outcomes in relation to cord blood. To be a confounding variable, sex would have to be related by definition to both outcome and exposure. Arbitrarily controlling for the greater number of male infants in the exposed group

has the effect of artificially lowering the birth weight of this group but they did not adjust for other factors as smoking which lowers birth weight. In fact, alcohol, smoking, maternal weight changes, parity and other variables which could conceivably be related to both exposure and outcome were not controlled in all analyses. There seems to be no clear rationale for the inclusion of specific confounding variables.

The study by Rogan et al. of North Carolina newborns whose mothers were selected before birth did not show a relationship between lower birth weight or head circumference and PCB exposure. (8) The Michigan study, however, reports this finding despite the fact that PCB levels in neonatal samples from mothers consuming fish in the Michigan study were even lower than the North Carolina samples. (6,8) If factors related to size are important control variables then controlling for male sex of infant as described above is not only factor to consider. Smoking is also an important known predictor of low birth weight. In the North Carolina population, head circumference was related to mothers' education and occupation with the latter variable being related to PCB levels. Thus, in order to draw conclusions regarding birth size and PCB exposure, the investigators must consider these other variables which also affect birth size.

The authors report a relationship of fish consumption to low birth weight, head circumference and gestational age and neuromuscular maturity based on the Ballard Examination. However, none of the Ballard measures show differences using cord blood to indicate exposure. In fact, there is almost no difference in Ballard measures between the exposed and non-exposed groups based on cord blood levels of PCBs. Furthermore, since only 67 percent of the total sample were given the Ballard examination, there may have been some selection bias as to which infants were assessed using this exam. For example, a predominance of those with problems at birth may have been included. Those problems may have been related to causes other than PCB exposure such as non-spontaneous deliveries, twinning or

other factors already identified in this group. Without knowledge as to how this 67 percent of the population was selected for examination, it is difficult to draw conclusions based on this observation.

The Michigan study infants were tested for neurological changes at 7 months using Fagan's test of visual recognition memory. Only 123 of the original population of 313 newborns or 39 percent received this test. The authors state that they had previously tested the population using the Brazelton Neonatal Behavioral Assessment Scale and found that contaminated fish consumption predicted poorer autonomic and reflex functioning indicating motor dysfunction. The Fagan test has been used to identify memory deficits in infants with recognized perinatal risk.

It is not clear how the current sample of 123 infants relate to the original group of 313 although the characteristics of the sample were similar to the original, the follow-up of only 39 percent of the initial group could lead to a very biased subset of children in this test population. The fact that there are different sets of control variables for both cord blood and fish consumption than occurred in the original population would indicate differences in the sample characteristics. For cord blood only maternal age is common among the variables between the first and subsequent analysis. For fish consumption the type of delivery and consumption of coffee and alcohol prior to or during pregnancy are no longer different in consumers versus non-consumers. Again, if the control variable was an important predictor of confounding in the original, it is important in the subset for analysis. The p value which was used to test for differences may be larger only because the sample size is now small.

The study relates poor visual recognition memory to prenatal exposures measured by fish consumption and cord blood but not to postnatal exposures. The authors then indicate that these neurological effects for cord blood were not mediated by birth weight, gestational age or

neonatal behavioral performance. However, the reported samples in all of these analysis indicate that additional infants have been omitted in each analysis because of missing data on confounding variables possibly resulting in even more selectivity.

The analysis of these data based on cord blood present a particular problem. As indicated in early papers the PCB levels could not be quantified below 3 mg/ml. Yet the regression analysis and the dose response data have utilized all levels. It appears that the effects reported are not related to continuous changes or dose response over all levels but to a different response of the few 29 infants who are in the extreme level of exposure. Among these, only 8 infants performed one standard deviation or less below the mean for the population. There should be serious questions about what factors have influenced the performance in this small subgroup.

The most recent paper has included 75 percent of the original population in a neurological assessment using the McCarthy Scales of Children's Abilities. Cord serum PCBs as a prenatal exposure measure and postnatal exposure from nursing were related to various performance measures in the neurological test. The results were reported to show verbal and memory deficits primarily in association with prenatal exposure and little effect from post-natal exposures. (5)

As in previous papers related to this population it is difficult to trace the numbers of children included in any analysis as well as to trace the reasons for inclusion of different confounding variables. The initial paper reported 241 children with cord bloods. This paper states only 146 children actually had usable specimens. While maternal age was included as a confounding variable along with four other variables in the original paper (3), in this paper the other four variables are not included and two new variables are added. No information is offered to explain why there are discrepancies between control variables in the two analyses of the

sample if the selection of variables for inclusion is based on differences between the exposed and non-exposed populations.

The observed neurological deficits are specific for memory and verbal performance. However, when the scores are graphically displayed in relation to cord sera levels although there is some suggestion of dose response the curves appear to be weighted heavily by the few individuals in the upper tail. It would be interesting to investigate these individuals and determine whether unusual maternal characteristics such as heavy alcohol intake might be the direct cause of the poor childhood performance and the high levels of PCBs rather than the PCBs being the cause as suggested by these analyses. There is a need to explain why this study shows neurologic effect when the North Carolina study using the same test and a larger population does not (11).

Despite the fact that the studies of the North Carolina cohort of newborns by Rogan, Gladen et al. does not confirm the Michigan findings, some neurological effects have been identified in that population and so the results are worth discussion. The population of newborns was identified through contact with the mothers before birth which would reduce recall bias based on disease. There were no signs of a relationship between birth size and levels of PCB in maternal sera or in milk samples at birth. (8) Yet the levels of PCB are reportedly higher than in the Michigan study. (6,8) There is also no evidence that fish consumption or any other known exposure has influenced these levels. (6) The effect appears to be due to the ubiquitous nature of the chemicals in our environment.

The data have indicated that prenatal exposure to PCBs as indicated by maternal milk is related to hyporeflexia and hypotonicity (8). The Michigan infants showed changes in autonomic maturity, reflexes and range state but not in relation to measured PCB levels but only in relation to the "soft" exposure measure of fish consumption. (8) There are also psychomotor

effects through 2 years of age using the Bayley test (9, 10). All changes disappeared at later years. (11) Since this population identified elevated PCBs associated with maternal problems during pregnancy and delivery (8) it is difficult to be sure whether maternal problems or PCBs are the explanation for the infants' neurological effects. Correcting for these maternal risk factors in models may not fully adjust for the influence of birth trauma on neurological function for example.

Rogan et al. use the initial milk sample after birth to represent transplacental transfer of PCBs to the infant. This is a poor measure of the newborns' body burden accumulated throughout pregnancy. Maternal milk levels do represent the mother's body burdens. The Michigan study indicated no correlation between cord blood and maternal milk levels. Therefore, milk levels are poor proxy measures of infant in utero exposure. The milk levels in the North Carolina studies have a further problem in that they are sometimes not real measures but estimates based on other samples as maternal sera or later milk level. The Michigan study used cord blood as the measure of transplacental exposure which also has limitations. The cord blood is only representative of the exposure around the time of birth which may be influenced by other factors traumatic admixture with maternal sera and changes during delivery. However, it is a somewhat more representative infant sample because it represents blood flow at one point in time. However, as reported by Rogan et al. cord sera may not necessarily be representative of "meaningful biological exposure". It certainly does not integrate exposure over total intrauterine time of the child's development. Therefore, for either measure, it is not clear what they represent in regard to intrauterine fetal exposure.

Both studies have suggested that neurological effects result in infants from exposure to PCBs in utero but no effects from postnatal exposure. Neither study has an adequate measure of what the fetuses' body burdens were through the period of development during which the

neurological effects would have occurred. In addition, the neurological effects or developmental effects as birth size are not consistent between the studies. One would think the same agent should affect the same brain functions. Both studies may not have controlled adequately for important confounding variables such as the maternal risk factors of alcohol consumption and delivery complications which might cause neurological complications in the infant as well as playing a role in elevating PCB levels. For these reasons neither study proves a causal association between PCB levels during fetal growth and neurological deficits after birth.

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TESTIMONY OF DEEOHN FERRIS, PROGRAM DIRECTOR,
ENVIRONMENTAL JUSTICE PROJECT, LAWYERS'
COMMITTEE FOR CIVIL RIGHTS UNDER LAW

Mr. Chairman and Members of the Committee, I appreciate the opportunity to appear before you today to outline the extent to which environmental pollution and environmental health issues affect communities of color in this nation.

The Lawyers' Committee for Civil Rights Under Law is a non-partisan, non-profit organization formed in 1963 at the request of President John F. Kennedy to involve the private bar in the provision of legal services to victims of racial discrimination. Through legal representation, public policy advocacy and public education on civil rights matters, we implement our mission. As Program Director of the Lawyers' Committee's Environmental Justice Project, I focus on devising interdisciplinary strategies and mechanisms to influence governmental and private sector decisionmakers concerning disproportionate environmental risks experienced by people of color and the poor.

The goal of the Environmental Justice Project is to strengthen community-based environmental justice activists in their efforts to prohibit environmental discrimination and develop remedies for the adverse consequences of prior discrimination. Our objective is to obtain equality by providing legal and technical resources for the needs of people of color, ensuring fair, equitable political participation and eliminating all barriers to equal environmental protection.

INTRODUCTION

In the New York Times last Sunday, reporter, Keith Schneider, wrote about the "new view" of environmental protection (New York Times, March 21, 1993, page 1, Keith Schneider). My testimony, today, describes a "new" focus of the environmental movement, the environmental justice movement, which is really not at all new. However, this movement does promote a new form of environmentalism-environmentalism which champions equal environmental quality for everyone.

The concept of environmental justice has emerged from the growing recognition that people of color and people with low incomes more often live and work in areas in the United States where environmental risks are high. People of color and people with low incomes are most often the unwilling recipients of hazardous waste sites, incinerators, industrial production facilities, pesticides and radiation exposure.[1] Furthermore, communities already adversely affected by disproportional pollution risks in the ambient environment may be inundated by indoor air pollution, caused by asbestos or lead-based paint, and occupational exposure in the workplace.

RACE IS A DETERMINING FACTOR IN DISPROPORTIONATE EXPOSURE TO POLLUTION

Racial disparities in the treatment of pollution risks are verifiable. Increasingly, evidence produced by government agencies, scholars, attorneys, scientists, journalists and citizens demonstrates that, even more important than income, race is the determining factor in terms of who is exposed to higher levels of environmental contaminants.[2]

People of color and ethnic groups represented in communities experiencing elevated pollution risks cross the spectrum, including African Americans, Latinos, Asian Americans, Pacific-Islanders, and Native Americans.[3] In general, communities of color face pollution exposures at levels and in multiple exposure combinations not regularly experienced by other segments of this society. Community-based organizations, academicians, attorneys, civil rights and environmental organizations, organized labor, health professionals and church groups are coalescing on these issues comprising elements of an omnibus campaign: the environmental justice movement.

Disproportionate risks posed by pollutants occur in both rural and urban areas with statistically significant populations of people of color. For example, urban communities face elevated exposures associated with air, land and water pollution; migrant farmworkers (most often Latinos and African Americans) in rural communities frequently are overexposed to dangerous pesticides; and exposure to low-level and high-level radiation is endangering Native Americans and Pacific Islanders on their lands.[4]

Documentation of environmental injustices experienced by people of color dates back two decades. Regional and nationwide studies, dating from at least 1971, show significant exposures for people of color as compared to whites, to noise, hazardous air pollutants, siting of commercial hazardous waste facilities, uncontrolled toxic waste, water pollution, radiation, pesticide poisoning, and location of solid waste landfills.[5] The federal government also documented inequities related to location of hazardous waste landfills in the South in a 1983 report by the U. S. General Accounting Office.[6] Recently, the State of New York and Johns Hopkins University have studied and correlated data on birth defects and other health effects associated with proximity to waste sites.[7]

Raising public awareness and agitating for change in this tragic predicament, the mulrncultural, multi-racial coalition of environmental justice activists across the United States, hearkening to the civil rights movement, are part of a growing mass social justice movement that demands equal environmental protection for everyone.[8] Activists in this movement are highlighting the need for additional empirical investigation and development of aggressive action plans at both the state and federal levels, legislation, a new regulatory approach to redress the

discriminatory distribution of environmental risks, and targeted federal enforcement.[9]

PRIORITIZING PROTECTION OF HEALTH IS KEY TO RESOLVING DISPROPORTIONATE ENVIRONMENTAL IMPACT

Prioritizing disproportionate impact issues and protection of human health should center on improving environmental programs as they affect communities of color. Integral aspects of improving these programs include a targeted government-wide research and development agenda and restructuring federal activities regarding data reporting, data collection and analysis.

In general, protecting human health and the environment are the principal federal priorities in environmental statutes. Commonly, however, cost-benefit analysis is the test applied in promulgating environmental regulations. In general, cost-benefit analysis provides an in-depth record of the price of regulation to industry, but provides inadequate analysis about either the toll of synergistic pollution and disproportionate risk on specific exposed populations (versus the aggregate exposure to the population as a whole) or the cost of failure to protect the environment.

Emphasizing scrutiny on the health and environment of those populations most exposed and most sensitive to environmental contamination during the regulatory development process will support development of regulations that protect inundated communities of color in particular, as ell as the general population.

Technological advancement in the tools of environmental and human health measurement is a requisite component of this increased scrvtiny. Revising risk measurement and monitoring systems, and improving the effectiveness of exposure data correlation to encompass synergistic effects, multiple sources and sensitive populations are ingredients essential to ensuring quality of life for over-exposed communities. To catalyze this shift in the risk analysis agenda, for example, the government could fund academic institutions historically associated with people of color, and regional research institutes to focus on research responsive to achieving environmental justice goals.

Modifications to the federal framework for protecting human health and the environment are also mandatory. Foremost, federal initiatives must vigorously pursue as goals pollution prevention, environmental and economic investment, waste minimization, reuse and recycling to reduce and, where possible, eliminate levels of potential disproportionate exposure. Furthermore, the framework must incorporate a pre-market strategy and, where feasible, post-market strategies for evaluating whether toxic and hazardous substances will enter (or continue in) the stream of commerce.

In addition to environmental justice, key elements of this evaluation framework should include assessments of the following

characteristics: (1) multiple ad synergistic exposure pathways; (2) health and environmental effects, including sensitive populations; (3) product safety; (4) need for the substance; (5) availability of less harmful substitutes and alternatives; (8) persistence and degradability; and (9) biocaccumulation factors.

Effectively, this evaluation matrix would shift the burden of proof. Instead of requiring affected communities to prove that exposure to a substance or substances that cause adverse health and environmental effects, industries which profit from their manufacture would bear the burden of proving the safety of those products. Without reducing scientific rigor, shifting the burden of proof to industry adjusts the regulatory process to a presumption in favor of safety and protection.

Similarly, in terms of prospective siting decisions, such as those involving energy production, chemical manufacturing, and waste treatment, storage and disposal, pertinent analyses must include an assessment of health, environmental, economic and distributive impacts on the projected recipient community. A government that evaluates paperwork burden on industry, regulatory impact on small business and effects on endangered wildlife should do no less than scrvtinize the impact on people.

Finally, prioritizing environmental programs must be based on protecting over-exposed and sensitive populations. For example, in December, 1992, the Environmental Justice Transition Group established a protocol for prioritizing EPA programs affecting people of color in a document entitled "Recommendations To The Presidential Transition Team for the U.S. Environmental Protection Agency on Environmental Justice Issues." This document is attached and, hereby, incorporated into the Subcommittee's hearing record.

Briefly, the Environmental Justice Transition Group recommends that work on issues affecting communities of color commence at EPA in eleven specific areas: (i) farmworker protection; (ii) protecting indigenous peoples; (iii) radiation exposure; (iv) waste facility siting and cleanup; (v) clean air; (vi) clean water; (vii) drinking water; (viii) urban areas; (ix) free trade and border issues; (x) strategic planning and budgets; and (xi) state program implementation.

UNEQUAL ENFORCEMENT CONTRIBUTES TO POTENTIAL HEALTH HAZARDS

Federal action pursuant to environmental laws and regulations consistent with equal protection principles is key to achieving equal protection from environmental exposures. However, a recent study by The National Law Journal, Unequal Protection: The Racial Divide in Environmental Law, Volume 15, No. 3 (September 2, 1992), revealed a failure to neutrally enforce environmental laws, with regard to ongoing activities which cause pollution, as well as past activities. Recenlly, the authors of this report received the Scripps-Howard Environmental Writing Award and the George W. Polk Journalism Award.

The alarming findings in The National Law Journal show disparities in environmental enforcement penalties in people of color communities compared to whites. Inequalities in enforcement are likely to exacerbate health risks and mortality rates caused by environmental exposures in communities experiencing disproportional effects.

According to report, disparities in enforcement pertain across-the board to enforcement of federal air, water and waste statutes. For example, the report shows that penalties under the Resource Conservation and Recovery Act[10] are from 46% to 500% higher in white communities than in communities of color (despite the overall absence of disparity between affluent and poor communities). The report also revealed disparities in the rate at which uncontrolled hazardous waste sites are listed on the Superfund[11] National Priority List and the pace and quality of cleanups conducted in people of color communities compared to white communities.

The evidence indicates that the federal government compliance and enforcement response in communities of color is unequal to compliance and enforcement activities in white communities. As stated by Robert Bullard, a noted sociologist and researcher on environmental justice issues, "Not only are people of color differentially impacted by....pollution, they can expect different treatment by the government."[12]

The need for an urgent federal response to correct these inequities is paramount. Federal agencies with jurisdiction over environmental issues directly affecting people of color are integrally involved in permitting, compliance and enforcement activities that have wide-ranging implications for affected communities. Therefore, the federal government is uniquely positioned to demonstrate leadership which will ensure that the Constitutional principle of equal protection is implemented in all aspects of federal sector enforcement activity.

CONCLUSION

Communities of color hardest hit by environmental hazards represent the spectrum of people of color including Asian Americans, Native Hawaiians, Pacific-Islanders, African Americans, Native Americans and Latinos. Disproportional pollution experienced by people of color envelops air, land and water; for example, mobile sources and stationary facilities that emit air contaminants, publiclyowned wastewater treatment works, stormwater and combined sewer overflows, radioactive wastes, solid and hazardous waste, land laid waste due to forestry harvesting and energy production activities, lead and asbestos poisoning, occupational exposures, application of dangerous pesticides, contaminated drinhng water, and toxic fish consumption.

As mentioned above, the environmental justice movement has spawned multi-cultural, multiracial coalitions and organizational

networks around the U.S. based on unanimity of resistance to categorization as a disposable segment of the population and agreement on an action agenda shared by people of color on eliminating disproportionate environmental exposures.

Recognizing that solutions to the range of problems as wide as those confronting this movement cannot be unilateral and are often complex to investigate, the government has failed to respond with either the rigor, discipline or seriousness of purpose integral to redirecting the way environmental protection mechanisms are implemented in this nation.

Coupled with the existence of nearly identical concerns confronted at state and local levels, environmental justice activists are inundated with issues to redress, hostile (or at a minimum, unresponsive) governments and, too often, resources available to the struggle for equal protection are too limited to compel meaningful government or private sector response.

The federal government must immediately undertake initiatives to remedy hazards posing disproportionate risks to the health and environment of people of color in the United States. Committed leadership in the federal sector is crucial to ensuring that communities of color no longer bear a disproportional share of our national pollution burden. In terms of alleviating discriminatory impact, a coordinated federal approach to environmental laws, compliance and enforcement activities is integral to focusing already limited resources into areas where they are most needed and most effective.

Footnotes:

[1]See e.g., "Transforming A Movement, Dana Alston, Race. Poverty and the Environment 1 (Fall 1991/Winter 1992).
"Black, Brown, Poor and Poisoned: Minority Grassroots Environmentalism and the Quest for Eco-Justice, 1 Kansas Journal of Law and Public Policy 68(1991).
"Environmentalism and the Politics of Equity: Emerging Trends in the Black Community," Bullard and Wright, 12 Mid-America Review of Sociology 25(1987).

[2]See, e.g., Race and the Incident of Environmental Hazards, Bunyan Bryant and Paul Mohai (Westview Press, Boulder, Colorado, 1992).
Dumnina in Dixie: Race. Class and Environmental Quality, Robert Bullard (Westview Press, Boulder, Colorado, 1990).
"Toward a Model of Environmental Discrimination." The Proceedines of the Michigan Conference on Race and the Incident of Environmental Hazards, Bunyan Bryant and Paul Mohai eds., (University of Michigan School of Natural Resources, Ann Arbor, Michigan).

"The Distribution of Air Pollution by Income and Race," Michel Gelobter (Paper Presented at the 2d Symposium on Social Science in Resource Management, Urbana, Illinois, June, 1988).

[3]See e.g., We Speak for Ourselves: Social Justice. Race and the Environment, Dana AIston, ed. (Panos Institute, September 1990).

EPA Journal: Environmental Protection - Has It Been Fair?, U.S. Environmental Protection Agency, Volume 18, Number 1, March/April 1992.

[4]See e.g., Environmental Racism: Reviewing the Evidence, Paul Mohai and Bunyan Bryant (Paper delivered at the University of Michigan Law School Symposium on Race, Poverty, and the Environment, January 1992).

Toxic Wastes and Race in the United States: A National Report on the Racial and Socio-Economic Characteristics of Communities with Hazardous Waste Sites, Commission for Racial Justice, United Church of Christ, New York, New York.

Natural Resources Issue: Race, Class and Environmental Relation, University of Colorado Law Review, Volume 63, No. 4, 1992.

"Native Hawaiian Historical and Cultural Perspectives on Environmental Justice," Race. Poverty and the Environment, Volume III, No. 2 (Spring 1992).

[5]See e.g., The Environmental Justice Framework: A Strategy for Addressing Unequal Protection, Robert Bullard, Draft, Unpublished 1992.

Reviewing the Evidence, *Ibid.*

[6]Report by the U.S. General Accounting Office, Siting of Hazardous Waste Landfills and Their Correlation With Racial and Economic Status of Surrounding Communities, GAO/RCED 83-168, June 1, 1983.

[7]American Journal of Epidemiology, Johhs Hopkins University School of Hygiene and Public Health, Risk of Congenital Malformations Associated with Proximity to Hazardous Waste Sites, Vol. 135, No. 11, July, 1992.

[8]We Speak for Ourselves, *Ibid.*

Activists are organizing from the bottom up creating community-based grassroots groups and regional networks to identify problems, and develop common strategies to crate solutions. For example, grassroots groups and their invitees have participated in several landmark meetings and conferences: The First National People of Color Environmental Ieeadership Summit involved nearly 1000 activists from the United States, Africa and South America conferring in Washington, D.C. in October 1991; for the past three years, the Southwest Network for Environmental and Economic Justice has convened an annual gathering of activists representing ten states; over 2500 participants joined the Southern Community Labor Conference in December 1992 to discuss the concerns of grassroots groups representing a radius of 14 southern states.

[9]See generally "A Challenge To EPA," Deeohn Ferris, EPA Journal Volume 18, No. 1, U.S. Environmental Protection Agency, March/April 1992.

[10]42 U.S.C. §6901 et seq.

[11]Comprehensive Environmental Response, Compensation and Liability Act, as amended 42 U.S.C. § 9601 *et seq.*

[12]The Environmental Justice Framework, Bullard, *Ibid.*

TESTIMONY OF DR. DAVID RALL, FORMER DIRECTOR, NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES, FOUNDER AND FORMER DIRECTOR, NATIONAL TOXICOLOGY PROGRAM

The middle and late 1900s saw a dramatic decrease in deaths due to acute infectious diseases, and a slow but steady increase in deaths due to chronic diseases. Mortality from cancer and chronic lung disease is still increasing, while deaths due to cardiovascular diseases and stroke are decreasing. Cancer death rates vary between countries and geographic areas. Since immigrants begin to die at the rate of their newly chosen country there must be environmental as well as genetic factors involved. Thus, cancer and chronic lung disease must, in part, be environmental diseases. It follows, therefore, that chemicals in the environment are responsible for part of these diseases.

The environment (air, water, solid waste, etc,) provides the pathways from the source of these toxic chemicals to the human population. Much of environmental health deals ultimately with the toxicology of these chemicals after human exposure. The adverse human health effects of air pollution and smog are largely due to the toxic chemicals which make up the air pollution and smog. Chemicals in the effluents from industrial plants and lechates from toxic waste dumps and chlorinated hydrocarbons in drinking water are all chemicals which are potentially toxic. Medicines, natural products and even foods are or contain toxic chemicals.

Essentially all compounds can be toxic- that is can have deleterious health effects-at some dose or with some use. Indeed it has been said that the dose makes the poison. Almost any agent-chemical or physical-may be toxic in certain normal and usual circumstances, but that will certainly show toxicity at high doses. Such common agents as oxygen are toxic under certain circumstances. oxygen is necessary for life, and is safe, indeed essential at around 20% in inspired air, but at higher concentrations can damage lungs and in newborns, damage vision. Thus, there are many kinds of poisons and under certain circumstances seemingly innocuous agents can become toxic.

The typical air pollutants such as Sulfur oxides, Nitrogen oxides, Oxidants and Ozone are the inevitable products of combustion of organic fuels. These, alone or in combination, are toxic to human lungs above some concentration.

Some poisons, however, have no other use than killing something. Pesticides are supposed to kill pests while leaving the applying species-human beings-or other valuable species-undamaged. However, DDT, the World War Two miracle pesticide killed mosquitoes very well indeed, and had very low acute toxicity, but it was discovered that-in the long term-it was toxic-it prevented reproduction by causing egg shell thinning-in condors and other desirable birds, and has been shown to have toxic effects in humans.

Certain compounds, such as TCDD (Dioxin) and some of its close

relatives, are unintended- and unwanted- byproducts of chemical production or combustion and have no known use, but can be highly toxic.

Persistent chemicals such as DDT and Dioxin are insoluble in water solutions but highly soluble in fat. These compounds, including also the PCBs and other chlorinated hydrocarbons, because of the fat soluability cannot easily be excreted from the body and there for are persistent. This persistence can lead to long term toxic effects. The successful effects of DDT lead to the synthesis and use of many similar compounds.

ACUTE AND CHRONIC EFFECTS

Many toxic effects occur soon after exposure or administration-acute effects, while others-delayed effects-only occur a long time after exposure or administration. Tinnitus (ringing in the ear) occurs promptly after ingestion of too much aspirin and warns of the onset of more serious toxicity. Laryngitis and cough occur immediately after exposure to chlorine gaspermanent damage to the lungs can become apparent years later. Acute exposure to asbestos elicits, on the other hand, no immediate reaction but can be followed three or so decades later by cancer-mesothelioma or lung cancer and asbestosis-a serious lung disease.

In the early 1960 the occurrence of many cases of phocomelia, flipper-like hands and feet, in newborn babies was a mystery. It was thought likely that something occurring during pregnancy was the cause. The problem was that the something had happened months ago, probably during fairly early pregnancy. Eventually the culprit was identified as the newly introduced sedative Thalidomide. Many months elapsed before this was suggested, and many more months before there was agreement that Thalidomide was the cause.

The thalidomide episode and the problems with DDT and asbestos lead to greatly increased concerns about the long term or delayed toxic effects of exposure to compounds.

This lead to the greater concern that some common diseases might be caused by polluting chemicals in the environment. The problem was to associate the effect with the preceding cause.

In 1958 there was an outbreak of sudden deaths in Tennessee. It was quickly established that the victims had taken a newly marketed Elixer of Sulfonamide. And it was quickly shown that the Elixer had been formulated with a toxic glycol, which was the lethal agent. This process took less than a week. Typically acute effects are easily seen in animal toxicity-safety-testing or rapidly identified after human used. It is relatively easy to suspect newly introduced agents, but much more difficult to identify agents introduced years earlier.

TOXICITY TESTING

Compounds are tested for toxicity in a number of ways. Experimental animals are administered the agent for a period of time. These animals

are carefully observed. Blood and urine samples are obtained. They are treated as if they were patients with an undiagnosed illness. All animals are observed and, if they die, autopsied. At the end of the study the surviving animals are killed and carefully autopsied. Tissues are taken for histological (microscopic) study. The toxicologist can determine if exposure to the agent had caused any damage to the organs and tissues of the animal. The cause of death of those that died before the end of the experiment can be determined. Both sexes are studied, and many doses are used, varying from no-effect levels to doses that cause disease and death. The duration of the study can be a single dose (acute) to multiple doses lasting up to 2 or 3 years (chronic). The time of observation also varies from 1 day up to years. Mice, rats, rabbits and dogs are most frequently used. Until the Thalidomide episode in 1962 long term studies and long observation period were rare.

There are a number of specific toxic effects that deserve special mention. Chemicals which cause cancercarcinogens- are a particularly difficult problem. Carcinogenesis is essentially irreversible and progressive. Once it begins it continues to frank cancer. Because there is such a long time between exposure and effect, human epidemiological studies, at there best, can show a causative relationship only after twenty or thirty years. This allows a whole generation of human exposureand perhaps disease. Epidemiological studies are difficult to perform and interperate. Determining exposure, confounding factors such as diet, medicines and other chemical exposures is uncertain. Small to moderate effects are lost in small sample sizes.

CANCER TESTS

Among the alternatives to epidemiologic studies are structure-activity studies, short-term tests and long term animal studies. Structure-activity analysis uses past experience of the relation between chemical structure and toxic effect to predict the effects from a new structure. This works well with a series of closely related chemicals, but is less effective with new structures. And new chemical structures are the most worrisome. Short term tests-typically tests in simple system for mutagenicityhave been shown to predict well for some kinds of carcinogens but not for others. Potentially serious carcinogens are therefore unfortunately missed.

Although time consuming and expensive, long term laboratory animal test are the best method available today to identify carcinogens before human exposure. They are of course not perfect, yet what biological system is? In tests mice and rats predict correctly more than 75% of the time. All known human carcinogens have been shown to be positive in such tests. Many laboratory animal positives, however, have not been shown to be positive in human studies. This is largely because of inadequacies in the epidemiological studies. These include small sample size, inadequate determination of exposure or too short a time for follow up. In addition, many compounds shown to be carcinogenic in animal studies are not used and therefore there is little or no human exposure. Laboratory animal tests have predicted the human carcinogenicity of many compounds. These include 4

aminobiophenyl, diethyl stilbersterol, mustard gas and nitrogen mustard, af lotoxin, bis chloro methyl ether, estrogens vinyl chloride and probably 1,3 butadiene, dioxin and formaldehyde. It has been reported that. although the studies were never formally published, asbestos was shown to cause lung cancer in mice in 1942. Doll's classic paper linking asbestos to lung cancer in man was published in 1955.

Animal tests have been criticized for using high doses. This is necessary because relatively few animals can be used-typically 50-100 per dose-because of expense. Small to moderate cancer incidence increases (5-15%) will be missed with those sample sizes. Yet a 5-15% increase in cancer in a population would be serious. While it may be true that some compounds are positive only at high doses, this only happens rarely. In a recent review of 52 carcinogenicity tests, 49 showed an increased carcinogenicity rate at 2 or more doses, and in 34 the increases were statistically significant at the lower dose(s). In only three studies (less than 6 per cent) was the highest dose the only dose showing a carcinogenic response. The synthetic rubber component 1,3 butadiene was shown to be carcinogenic in mice in 1983 at both of the two high doses-near or at the OSHA limits-at which it was tested. A repeated study showed that at doses 100 fold less, 1,3 butadiene still was carcinogenic. A number of studies have shown that the dose to rodents that caused cancer, in most instances, was close to the amount that cause cancer in humans.

HOW MANY CHEMICALS ARE CARCINOGENS?

It has been claimed that most chemicals are shown to be carcinogenic in laboratory animal tests. This is true if a weak biological response is considered adequate to call a chemical carcinogenic. Strict decision rules and a requirement that a positive response must occur in two separate experimental sets provides a more realistic estimate of carcinogenicity. If this is done about one third of tested chemicals are positive (and many were tested because of suspicions of carcinogenicity). A recent study showed that only 30% of 102 pesticides, solvents and metals were carcinogenic.

LONG DELAYED TOXIC EFFECTS

The decades long latent period between human carcinogen exposure and cancer onset illustrates a major problem faced today in the field of Environmental Health- the delayed or long term effects of environmental agents that show no immediate toxic effects. Yet to associate an early exposure with a late toxic effect, the occurrence and extent of that exposure has to be known. How many of us can remember what foods we ate, what medicines we took or what other odd toxic chemicals we any have been exposed to some decades earlier? Records of air pollution levels, pesticide levels in food, occupational exposure levels, drug prescription record, etc. are generally lacking.

For some persistent compounds such as DDT and Dioxin which remain in the body for long periods of time new technologies will help. Chemical methods to detect these compounds are becoming more sensitive and it

will become easier to relate chemical residue as measured in the body to disease occurrence. For instance in a study of the carcinogenicity of Dioxin it was possible to measure plasma Dioxin concentrations in groups of workers and show that Dioxin levels were higher the longer the duration of employment. There was significantly more cancer seen in workers who had worked longer periods of time. Since the cancers were a late effect, the relationship was not clearly seen until after 20 years.

Recent research in molecular biology is finding ways to approach this problem. Many chemicals that are carcinogenic act by damaging and altering DNA-causing mutations. New technics can measure tiny amounts of damaged DNA which often is retained in the body for some time. This yields information of the nature of the exposure. Some of these mutations activate oncogenes-fragments of DNA that are involved in initiating cancer or inactivate genes that suppress cancer formation. These can now be identified in both induced tumors in experimental animals and in human cancers. In animal studies it appears that many carcinogenic chemicals cause consistent and identifiable mutations in the DNA of newly initiated cancer cells that are specific for certain chemicals. This can help relate a human cancer to an earlier chemical exposure.

There are many studies which attempt to define the mechanism of action of carcinogens. These have yielded useful information, but ultimately we still do not know why chemicals are carcinogenic-not even for such well studied compounds as asbestos or mixtures like tobacco smoke.

MULTIPLE CHEMICAL EXPOSURES

We are exposed to many chemicals all at the same time. Which air pollutant is the toxic one-sulfur oxides, nitrogen oxides or particulate? Or are they surrogates for the true toxin? Research in combination toxicity is complicated and expensive, but many laboratories are beginning the effort. Some early results suggest that the effects are often additive-the second chemical adds its effect to the first chemical, and can be multiplicative (causing a greater effect). This becomes worrisome since many water and air pollutants are not identified. It has been estimated that only 10% of the chlorinated hydrocarbons found in some drinking water supplies have been identified.

NEUROTOXINS

There are special problems with agents that are toxic for the brain and nervous system. In general the central nervous system does not regenerate. If neuronal cells die or are destroyed they do not grow back. Fortunately we are endowed at birth with an apparent excess of nerve cells. However, they die off at a steady rate, but at a rate that would allow for the maintenance of an adequate number of brain cell until old age. However some agents kill off brain cells. If exposure to such a neurotoxin occurs at an early age no effect will be seen on brain functioning at first, but as old age approached the missing cells will cause an earlier senility, and the damage caused much earlier will not be noticed for many years or decades.

LOW BIRTH WEIGHT BABIES

A significant public health problem is the too frequent occurrence of low birth weight (for age) babies. Such babies have a history of frequent diseases and low life expectancy. It is likely that exposure to toxic compounds contribute to this problem. In animal studies testing chemicals for teratogenicity-causing birth defectsreduced birth weights occur at doses of teratogenic chemical below which teratologic effects are seen and which are otherwise nontoxic.

HOW MANY CHEMICALS HAVE BEEN TESTED

A number of studies in the 1980s suggested that most of the compounds in common use today have not been tested or have been inadequately tested. Only 10% of pesticides and pesticide ingredients had enough data in the literature or from other sources necessary for a complete toxicological assessment, and 66% had no or very little data available. For drugs and excipients adequate data were found in 18%, while 64% had little or no data. Only 5% of food additives had adequate data, and 81% had little or no data. A study of EPA pesticide data files in the early 1980's showed essentially the same results, as did an OECD report in the late 1980s. This suggests that there are serious data deficiencies in the environmental health data base.

REGULATORY RESPONSE TO TOXICITY INFORMATION

A recent OTA study looked at the response of the US health regulatory agencies to laboratory animal carcinogenicity data. They found that most known mouse or rat carcinogens were not regulated. Many "regulatory gaps" were found and it was noted that few were banned. This study suggests that, for carcinogenic chemicals at least, we are not over regulated.

TOXIC CHEMICALS

The identification, characterization and-if necessarycontrol of toxic substances plays a key role in environmental health. The appropriate use of the information from laboratory animal carcinogenicity studies is the only method to identify potential human carcinogens before human exposure. This can, if used wisely, can prevent exposure of segments of the population to carcinogense and save lives. Much has been done, much more is needed. Molecular biology is providing new and powerful tools which will permit faster and more certain identification of toxic environmental hazards.

Questions from The Honorable Dirk Kempthorne
Submitted for the Record
Senate Committee on Environment and Public Works
March 24, 1993
"Taking Stock: Assessing Environmental Threats"

Questions for Dr. David Rall:

1. Epidemiologists, Richard Doll and Richard Peto, both influential in establishing the link between cigarette smoking and cancer, have stated that, when the aging of their American population is taken into account, there is no convincing evidence that there is a general increase in cancer related to the conditions of the modern industrial world. Yet, you [Dr. Rall] seem to say in your written statement that cancer is, in part, environmental as demonstrated by the adjustment of immigrants to death rates in the U.S. Can you reconcile your views with those of Doll and Peto?

2. Exposure to chemicals was widespread and uncontrolled more than forty years ago, and thanks to our environmental laws, exposure has actually decreased in the last two decades. The U.S. population appears to be healthier than fifty years ago and we have seen no increase in reproductive or other problems. what data is there to substantiate claims that there is a cancer epidemic being caused by manmade chemicals?

3.A. When studies and animal testing are being carried out regarding the toxicity or carcinogenicity of individual chemicals, how are those studies that yield negative results incorporated into making the determination?

B. How much more accurate would final determinations be if the findings of all studies were considered?

4. A couple of years ago, the EPA Science Advisory Board issued a study that was highly critical of the scientific work performed by EPA. The former Administrator, Reilly, attempted to address the problem. Could you evaluate the progress that EPA has made in this area? What steps should Congress look at to assist EPA in improving its scientific basis for decision-making?

David Rall MD Ph D 5302 Reno Rd Washington DC 20015
April 14, 1993

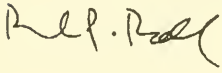
ANSWERS TO THE HONORABLE DIRK KEMPTHORN, March 24 Hearing

1. There is no question that cancer rates- age adjusted- are increasing in industrialized countries, This increase is greatest in the older population, and this is particularly important because 2/3s of cancer deaths are in those over 65 years old. This increase was attributed to better health care for the elderly and better diagnosis of cancer by Doll and Peto. It is increasingly clear- as these trends continue to increase- that they are real. Sir Richard has recently agreed. The cause is not known, but it is true that immigrants take on the cancer rate of their new country. It should be noted that cardiovascular and stroke deaths are decreasing.

2. Some exposures are up and some exposures are down. Many new chemicals have been put into use since the 1950's. The sheer volume of industrial chemical production and ultimate entrance into the environment has increased dramatically, while the number of people employed in "dirty" industries has decreased.

3. A and B Negative studies are always considered in judging the results of toxicity- including carcinogenicity- testing. Many negative tests occur because the dose of the chemical was too low, too few animals were used and/or the duration of exposure or subsequent observation was too short. A well conducted negative study is important, but a badly conducted negative test cannot counter a well conducted positive test.

4. Congress should insist of high professional standards for the leaders of EPA. Peer review is important, but it should be clear that the reviewers must not have conflicts of interest. The EPA has made some progress, but it has a way to go.



. . TESTIMONY OF JOHN A. MOORE PRESIDENT, INSTITUTE FOR EVALUATING HEALTH RISKS

Good morning, Mr. Chairman and members of the Committee. I am Dr. John A. Moore, President, Institute for Evaluating Health Risks, Washington, DC. I am pleased to have the opportunity to testify before you today.

I commend this Committee on its decision to conduct this hearing today which seeks not to focus on a specific law or chemical issue but considers the broader view of how well our aggregate activities have served to protect the public health and the environment. Hopefully, my career which includes fourteen years as a research toxicologist and program manager at the National Institute of Environmental Health Sciences and the National Toxicology Program and then, six years at the Environmental Protection Agency as either Assistant Administrator, Office of Pesticides and Toxic Substances, or Acting Deputy Administrator provides a base of experience that may be of value and interest to this Committee. For the past four years, I have been developing the programs of the Institute for Evaluating Health Risks, a non-profit entity that has received funds from the private sector as well as state and federal governments. This experience has further broadened my perspective on many issues relevant to today's hearing.

Let me state in a most positive way that, over the past two decades, Federal laws have led to very real gains for public health and the environment. A few examples follow. The phase down and elimination of lead in motor fuels is a public health benefit of the first rank. The program that led to construction of large numbers of primary and secondary sewage treatment plants resulted in major reductions in the pollutant loading of this nations' waters. Instances of gross point source pollution into our waterways have receded from commonplace to infrequent or even rare. Clean air legislation and regulation have had a phenomenal impact in reducing levels of pollutant emissions into the atmosphere; unfortunately large population increases have often negated the realization of major net reductions. As a final example, more aggressive control over the types of pesticides used, and the nature of their use(s), has resulted in marked decreases in the exposure of our citizens to many pesticides; in some instances we have also seen dramatic rebounds in certain wild bird populations.

This country should derive a fair measure of satisfaction in the very real progress that has been made in the identification and control of exposures to toxic levels of chemicals; yet, it would be wrong to assume that the challenge has been met and the environmental and public health issues are behind us. It should come as no surprise that in some instances we have over responded to a concern whereas in other circumstances we undershot a goal that can, and should, result in real public health gain. Perhaps what is needed is a modest effort devoted to gathering objective measures of accomplishment for representative activities that have been previously initiated. Can we get a sense as to the magnitude of cost for specific actions as well as some measures of gains realized? Selected activities of this sort should not be initiated with an eye toward exacting retribution or recrimination for programs with limited success. Rather the objective should be to enlighten as to what worked or fell short of the mark, and why, so that we can profit from such insights when we consider new or persistent challenges.

As we look forward we need to be cognizant that the nature of many public and environmental health issues are changing. Current and future needs may be more difficult to address because, compared to the doses and toxic effects observed twenty years ago, tomorrows toxic concern may be quite subtle and the levels of exposure quite low. If we are to continue to progress we must ensure that improvements are realized in the processes that are used to determine that a chemical may pose a public health or environmental risk. Improvement in this area would need to include how the results from such technical processes are communicated. To some degree todays' procedures have succumbed to societal and legal pressures that demand answers in absolute terms. In todays world the answer sought must be cast in absolute terms - Is it, or isn't it a carcinogen (neurotoxicant, reproductive toxicant, etc.). Science performs poorly when required to deliver in such absolute terms and it will not serve the true needs of society if it continues upon the current course. The processes for current and future needs must be revised so as to inform as to type of adverse effect that may be associated with a chemical exposure, its potency to cause such an effect, and convey some sense of the likelihood that an adverse effect may occur. Permit me to provide several illustrations.

For the last fifteen years the statutory and regulatory agenda dealing with chemicals has been dominated by concerns as to cancer risk. From a public health point of view it is essential that one develop a profile of the range of a chemical's toxic potential and not continue to be driven by a cancer myopia. My reason for encouraging such a change, which has started to occur, is that there are chemicals that do not cause cancer but do cause other types of toxic effect, i.e., effects on development, infertility, or neurotoxicity. Further, I believe that much of the scientific disagreement, and attendant public uncertainty, over the potential for many chemicals to cause an adverse effect emanates from the procedure routinely used in the United States to quantitatively estimate cancer risk. Unfortunately, cancer risk estimation, as practiced in this country, blurs any statement as to the qualitative scientific judgment that a chemical may be a human carcinogen. There continues to be a rote over reliance on the ability to produce an adverse effect in test animals with minimal attention accorded to the likelihood that such an effect may be seen in humans. Let me illustrate. Asbestos, when inhaled, poses a risk for the development of lung disease, including cancer. On the other hand, ingested asbestos, which often occurs through water consumption appears to pose, at best, a negligible health risk. Occupational exposure to asbestos in air has had tragic results as we all know, yet only belatedly have we heeded the information which underscores that asbestos in a building will pose more than a negligible risk only if the asbestos containing surface is friable with release of fibers to air. Some judge silica to possess the potential to cause cancer; isn't it also important to convey the very real differences in the certainty of belief between asbestos and silica as to cancer potential, and the differences in the magnitude of exposures that are likely necessary to cause such an effect. Let us require information to be conveyed in a way that permits the public, and the decision maker, to gain a sense of perspective as they form their opinion on an issue. I for one still favor the availability of sand boxes for toddlers.

A seemingly vexing issue that is in current vogue is that laboratory methods used to determine toxic potential of a chemical for humans may provide misleading results. This concern is particularly focused on cancer tests. The real issue is how to revise the processes used to judge

that a chemical may pose a human health risk when advances in scientific knowledge suggest such a change may be warranted. Historically, most test data that is collected is observational in nature, i.e., a chemical is given to an animal for a certain period of time and effects on such things as body weight, blood count or birth defects are recorded. Advances in research methodology over the last decade has made it possible, in some instances, to gain some insight as to the biological processes that may have been involved in, or led to, the observed adverse effect. Such insight can permit a better scientific basis for concluding that an effect seen in a test animal may (or may not) be likely to occur in humans. As methodological advances occur there is a need for scientific regulatory policy to accommodate this additional knowledge. The initial challenge is to judge whether the "new" methodological data is sufficiently robust that a change in interpretive procedures is appropriate. When such a process occurs there are some that would state no action on any chemical is warranted until data using the new methodological approach are at hand. Such a posture could result in delays that may adversely impact the public health. It would seem more appropriate to assume that an adverse effect seen in traditional tests could occur in man until such time as the methodological data is available that indicates that the effect is limited in its prediction for human risk. In times where there may be sea changes occurring in processes that determine health risk potential due to the application of new scientific knowledge, this Committee would serve the public need by remaining cognizant of three points: 1) detecting instances where a result in an experimental animal may not accurately predict an effect in humans does not erode the utility of the traditional testing approach - rather it has improved the predictability of the approach; 2) the processes that are used to identify environmental health risks should create an incentive for receipt and use of data that enhances certainty of judgment, i.e., encourage the use of meaningful data rather perpetuate persistent use of default assumptions; 3) encourage the robust use of scientific peer review mechanism(s) that can provide timely assist and advice to government in the use and limitations of new methodologies or advances in knowledge.

Finding that the predictive utility of certain test procedures are fallible, in some instances, should not presume to invalidate the use of laboratory procedures and animal testing. It is a methodological approach that has served this and other developed countries well for most of the twentieth century. In plain language, it works. It is the critical pre-screen in drug development and is the backbone for determining safety of food additives, profiling the spectrum of pesticide toxicity, and indicating toxic potential of other chemicals. At the same time, it is reasonable to demand that procedures evolve or are revised consistent with new knowledge and experience. Constant validation against human health data, when available, should also receive a higher priority. The common goal should be the use of a process that represents the best application of our current knowledge, perhaps there sometimes is too great a reluctance for change. If we do not maintain and enhance confidence by the scientific community in the processes used to predict and quantify public health or environmental risk then I fear there will be a dramatic erosion in the public trust and support of endeavors that rely on such information.

As we develop knowledge that a chemical is a public or environmental health concern there is not always an attendant increase in wisdom concerning the use of such knowledge. There sometimes appears to be an inability to tailor management decisions to reflect differences in risks

associated with exposure to the same chemical. Lead can illustrate this point. Lead exposure to infants and preadolescent children arguably is the major environmental health issue in this country today. The principal health risk is exposure to lead found in house dust, levels are highest in homes that have deteriorating surfaces that were at one time coated with lead based paints. Much of the low income housing in this country has lead painted surfaces of this sort although all older (pre 1970) housing has a high likelihood of containing lead painted surfaces. There is an accruing body of data indicating that lead in many soil matrices contributes very little to the blood lead level of children that are exposed to and even play in such lead contaminated areas. Current regulatory practice is to assume that lead from all sources is equally bioavailable, a policy that results in remediations that are extremely costly and fail to deliver a significant improvement in public health that is implied when taking such action. This is an example of a default assumption that needs revision based on newer information. Investing significant levels of funds in the removal of lead containing soils in many areas is a poor investment of this nations finite wealth and also trivializes and demeans the important task of remediating other significant sources of contamination. A perverse impact of such a simplistic and flawed policy is that lead levels in soil are sometimes cited as the reason for not remediating a home with deteriorating surfaces under the claim that it would be without effect since major sources of lead in soil remain. Instances such as this tragically divert or diffuse the focus on what is known to be a priority public health need, lead painted surfaces in homes.

As was illustrated with the lead example we must not tolerate the overly simplistic use of knowledge that certain chemicals can cause adverse effects. I fear that such may be occurring by those who would propose to ban the use of chlorine and all chlorine containing chemicals in the Great Lakes Basin. It is highly questionable that the public health would be beneficially served if chlorination of municipal water supplies were eliminated because of health concerns associated with haloforms in drinking water. At a minimum there is a clear need for a scholarly and thorough risk benefit analysis of this issue. Perhaps, as a corollary, there is a need to examine or reexamine the data which underpin allegations that aggregate exposure to all chlorine containing chemicals is having, or will have, adverse public health or environmental effects. A task of this sort would necessitate the reassessment of older persistent chemicals such as chlordane, DDT, heptachlor, and PCBs as well as many current chemicals used in our society. Such a proposal, if implemented, would have tremendous economic and social impact and would seem to warrant such a thorough review, we need to be sure the facts are correct when contemplating such a major action.

The changing nature of the ways by which chemicals gain penetrance to our home and general environment indicates that there is a need to revise the method traditionally used to assess exposure potential to a chemical. Very real gains were realized in the past through a media specific focus; however, greater effort is needed to foster a holistic or life cycle approach. This latter approach goes beyond consideration of adverse effects associated with a specific chemical use to a consideration of the nature of adverse effects (if any) associated with mining or production of the chemical as well as with its disposal or environmental fate. It should also seek to determine if there are diverse sources of exposure. This concept was a prominent consideration in estimating asbestos risk in the ill fated EPA regulation to ban future asbestos

use. Notwithstanding the Court of Appeals action that struck down this regulation, the conceptual logic of a life cycle approach has great merit and should be inherently embodied in all pollution prevention programs.

In summary, real progress has been made in identifying chemicals that can cause adverse health effects and in controlling exposure to such chemicals. Continued progress can be realized only if processes used to determine potential health effects keep pace with advances in scientific and technical knowledge. Greater consideration needs to be accorded to determining the spectrum of toxic health effects that may be caused by chemical exposure and in determining with greater accuracy the nature of those chemical exposures that present a significant health risk. The challenge is to refine approaches so that significant public health and environmental risks are clearly identified and addressed in a timely manner.

I would be pleased to answer any question the Committee may have.

TESTIMONY OF DEVRA LEE DAVIS, Ph.D., M.P.H.

Thank you for inviting me to testify on the important subject of environmental health research. My name is Dr. Devra Lee Davis. I am a Fellow in the American College of Epidemiology, a Member of the American College of Toxicology, a faculry member of Mt. Sinai Medical Center, Department of Environmental and Occupational Medicine, and Senior Scientist at the U.S. National Research Council of the National Academy of Sciences in Washington, D.C. 1 also serve as an advisor to Health and Welfare Canada, to the National Institute of Environmental Health Sciences, and to other national and international governmental agencies. 1 have written or contributed to more than 100 articles and edited several volumes in the fields of public health, public policy and cancer research.

My remarks today do not represent the official views of any of the institutions with which 1 am affiliated, and are based on the research that I have conducted, together with distinguished collaborators in more than a dozen countries. Copies of some of the relevant articles that we have produced on this subject are available to the committee and your staff, and are described in an appendix to my remarks. [Editor's note: The articles referred to have been retained in committee files.]

INTRODUCTION

By some criteria, many Americans are healthier than ever. The majority of us are living longer, and contracting less heart disease, But, more of us are developing chronic diseases, such as cancer, renal disease, chronic neurological disease, asthma and other debilitating diseases, with rates for African Americans generally increasing more so than those for others. As more and more people are extending their quantity of life in this great country, we are entitled to ask, whether they are also extending their quality of life? We know that many of the causes of common diseases today are quite hard to change. These include: genetics, dietary factors of a lifetime, and fierce addictions and bad habits established early in life, such as smoking and alcohol drinking. Most chronic degenerative diseases reflect a number of factors, including many which lay far beyond individual or social control, such as family history and background radiation. We need to answer two key questions: what proportion of common diseases today could be reduced or prevented by social or governmental changes? How do environmental factors, broadly conceived, affect the quantity and quality of life?

WHY WE BELIEVE SOME DISEASE CAN BE PREVENTED

People cannot choose their parents, and have limited influences over other possible causes of disease, such as what they breathe and eat and where they work and play. Because common chronic disease patterns vary substantially from country to country and change as people immigrate, experts believe that a substantial proportion of many of these diseases may be

avoidable. But exactly how much preventable disease occurs and the relative importance of different contributing causes remain matters of intense interest.

PATTERNS OF DISEASE HAVE CHANGED RECENTLY

In general, whites are living to older ages and dying less of infant mortality, but more of cancer. But, African Americans have not made the same progress. For all Americans, cancer is no longer uncommon as it was at the turn of the century. It now causes one out of every five deaths in many industrial countries, and more than one out of every 3 deaths in industrial areas, such as Bologna, Italy. In 1988, more than 500,000 Americans died from cancer and more than 1 million cancers were diagnosed. The former number exceeds the number of combat deaths in World War Il. With respect to many chronic diseases, African Americans are faring more poorly in recent decades. Their survival for cancer is less today than it was two decades ago, according to the National Cancer Institute. In fact, reductions in infant mortality and total mortality for whites reflect the successes of heroic medical treatments and of better prenatal care, but do not necessarily mean that we have similarly improved the quality of life.

WHY WE HAVE TO FIGURE OUT HOW TO PREVENT DISEASE

As part of the national inventory of American health, renewed attention is being paid to how best to: assess current and future patterns of chronic diseases, figure out preventable causes of chronic disea<es, and devise strategies to prevent or 5 reduce their financial and social burden. The increased costs of treating chronic diseases are a truly staggering part of the 14% of Gross National Product devoted to health care. The direct and indirect costs of cancer were about $80 billion in 1989. Even so, the tobacco industry, which arguably produces the best known preventable cause of cancer today, spends more on advertising in one year, than the government allocates to the National Cancer Institute for research on cancer.

As to other diseases that also appear to be increasing, their costs have risen rapidly as well. Thus, asthma and renal disease have been estimated to each run about $6 billion annually.

WE MUST REDUCE THE DEMAND FOR HEALTH CARE BY PREVENTING CHRONIC DISEASE

We are entering a serious national debate about how best to allocate scarce health resources, and reinventing the roles of government in the process. In the context of ever-increasing costs for the treatment of escalating chronic diseases, this means figuring out new and expanded functions for government and partnerships with the private sector that will help keep people healthy--a field called disease prevention and health promotion. Consistent with the Protestant Ethic and its emphasis on

individual responsibility, we have pioneered in encouraging people to change their individual lifestyles to foster health. From a social perspective, however, we have failed to take steps to foster these same policies. Despite efforts of several previous Surgeon Generals, advertising for many of these same health risk factors, such as alcohol drinking and smoking, is still allowed and targeted to high risk groups, such as 6 minorities and women.

In any case, it should be noted that programs to discourage unhealthy lifestyles are much more successful with persons in the middle-class, than with those in lowerclasses, for whom these efforts are possibly more important. A subtle message of many of these programs is that you are responsible for your health completely--so, if you get sick, it must be your fault.

Still, a variety of corporate and government programs have tried to teach people to engage in safe sex, avoid fats, and eat their vegetables, and to be sure to say no to drugs and alcohol. None can quarrel with the sentiments. But as my colleague Marvin Schneiderman put it, "you cannot say no, to an invisible toxic chemical in the food chain that is not even being measured. Or, just try saying no to that belching power plant or incinerator, for which standards have been questionably devised."

A MlLLlGRAM OF PREVENTION, SAVES BILLIONS IN CURES

In my remarks today, l will briefly discuss several key challenges remaining for environmental health research. My basic message is quite simple and was succinctly put by Ben Franklin about 200 years ago--an ounce of prevention is truly worth a pound of cure. In today's parlance for every milligram of toxic material to which we prevent exposure, we will save billions in costs of remediation, treatment and cure. This translates into some rather startling numbers. For every 1% of cancer that we can prevent, we save about a $1 billion in direct costs and indirect costs. For lead poisoning, as Dr. Rall just told you, for every $1 billion we invest over the next 20 years, we receive a direct benefit of nearly $2 billion, in improved worker productivity, reduced health care and treatment costs for lead-poisoned children. According to several governmental estimates recently provided, an expenditure of $32 billion in housing rehabilitation of some 23 million units, will provide a benefit of some $63 billion over the same time period.

In order for us to break the logjam on health care costs and devise more effective policies, we have to figure out how to reduce the demand for health care at the outset, by reducing sickness and disability in the first place. We must guard against staying fixated on the narrow economic issues of cost containment, and failing to address prevention possibilities. By treating chiefly the symptoms of inflated health care costs, we allow the fundamental causes of these symptoms to go unchecked. Of course, we need serious economic controls and investments in primary prevention, such as immunization programs. But, we also

need to ask some tough questions about whether we can prevent a substantial burden of chronic disease today. If we fail to progress in this realm, we will simply become more efficient at processing sick people, rather than better at promoting health.

We cannot afford not to invest more in preventing disease before it occurs. There are actually three different types of prevention-oriented research. Tertiary Prevention seeks to avoid deaths and involves treating persons with diseases in an effort to reduce their death rates. Secondary prevention seeks to reduce sickness, and often means screening people at high risk of disease, in an attempt to keep them from becoming ill. Primary prevention means keeping people from getting sick in the first place.

As to the value of preventing lead poisoning, according to the Centers for Disease Control Strategic plan for the elimination of childhood lead poisoning, issued in February, 1991, we face a true epidemic of lead poisoning of children in the U.S. today--one, which is all the more tragic, because it could have been prevented. Accordingly, to the CDC and ATSDR, children of all races and in both cities and suburbs are affected by this equal opportunity pollutant. More blacks than whites are believed to have elevated levels of lead. Indeed, so long as the problem was believed to be chiefly one of minorities in the past decade, little happened to address the matter. But, lead, like many pollutants, does not discriminate in its effects. Those with undue levels are permanently affected. Moreover, while inner city residents are disproportional afflicted, the proportion of whites is not trivial, ranging from 34% in richer suburbs to 90% in poorer central city areas.

Levels of lead previously believed to be safe are now regarded as toxic. The action level has dropped from 50 some two decades ago to 10 micrograms per deciliter today. Sources of lead include: lead dust, chipping old lead paint, and lead in drinking water. Public health officials now estimate that 60 million homes have lead hazards, principally from paint. A recent EPA survey found unhealthy levels of lead in 130 water supplies serving 32 million people.

More than fifty years ago, public health specialists like Alice Hamilton and others warned of the disastrous consequences of using lead in paint, in industry and introducing lead into gasoline. Only in the face of overwhelming evidence confirming human harm in the last decade, has government action belatedly begun again to address this predicted scourge. In the waning days of the Bush Administration belatedly struggles to implement programs for nationwide screening and testing of children, which were among the first abandoned by the Reagan Administration in 1981.

SCIENTIFIC UNCERTAINTY IS NO DEFENSE

Many critics of past policies have recently wrapped themselves

in the banner of better science, as the weapon with which to resolve these admittedly troubling problems. "Better science" is being held up like a cross to the vampire, as the means to transfix the problem and stave off economic ruin and devastation that will surely follow. But, think about this: It is possible that this focus on better science has some downsides as well. Two types of risks need to be examined -- the risk of falsely regulating something that needs no such control [commonly called a false positive], and the risk of falsely exonerating something that poses a hazard [called a false negative]. To put it simply, which risk does the American public want its government to make--Should we err on the side of providing too much protection to public health and the environment, or should we orr on the side of overly protecting chemicals and industry?

A recent Post editorial noted that presumptions about re-registration and regulation in the pesticide arena are so bizarrely complex that pesticides have more civil rights under the current system, than do people. Moreover, if we insist on always having `better' science, we are embarked on what the philosophers call an infinite regress, as there is literally no end to ways to make science better.

Even put in this fashion, the choice is not clear. But this is precisely how the choice needs to be cast. No matter how many breakthroughs we may make in the scientific arena, scientists will never be able to resolve many of the bona fide conflicts and controversies surrounding how to conduct and interpret animal tests, and the general problems of inconsistent setting of priorities. So we are forced to delegate to the agency decision makers the really hard job of making choices in the face of uncertainties. We may reduce some of these uncertainties, but we cannot eliminate them, because of the fundamental nature of scientific inquiry.

WHY DO WE TEST ANIMALS? SO WE DON'T "EXPERIMENT" ON PEOPLE

In this context, remember why we bother to conduct experimental tests at all. We study animals experimentally, so that we can avoid conducting uncontrolled experiments on humans. Animal tests become the key means with which we attempt to predict future effects of chemicals. Admittedly, the current system is imperfect, as is any scientific endeavour. The Times story focused chiefly on flaws and inconsistencies with animal testing. Missing from that story, and indeed from much of its series so far, is the public policy rationale for why we conduct such tests.

Animal tests and models offer a classic tool for public health specialists. We seek to prevent disease from occurring in the first place. If we fail to heed clues from animal studies, we are forced to rely on evidence of human harm, which can only be obtained AFTER harm has occurred in sufficient quantity that it can be detected. This is a questionable basis for public policy. Consequently, we look for techniques that can allow us to estimate future impacts, so that we can avoid incurring harm. In that context, consider what has happened to funding for animal research in this government over the past decade.

[examples of DBCP and vinyl chloride, where failures to heed animal data led to later human harm]

FUNDING FOR ANIMAL TESTING DOWN IN THE U.S. GOVERNMENT

Last year, the only part of the National Institutes of Health to receive no increase in funds was the National Institute of Environmental Health Sciences. In fact, its budget this year is less than it was a decade ago, adjusted for inflation. NIEHS was able to begin testing on fewer than 10 chemicals last year, a fivefold reduction in the number tested about a decade ago. Indeed, the great bulk of the NIH budget supported disease-based treatments, with so little allocated to primary prevention that NIH could properly be called the National Institutes of Disease. Support also fell during this decade for occupational safety and health inspectors, meat inspectors, drug surveillance and monitoring, persons to monitor huge clean up activities at EPA and DOE. In the latter case, this has left each agency with more responsibilities and fewer resources to carry out their tasks. Thus, despite congressional intent and rhetorical commitment to better science, the past Administration failed to provide adequate resources with which to: monitor environmental pollution, inspect workplaces, resolve the impact of hazardous wastes on public health, and address other potential research questions of great importance to this country.

OCCUPATIONAL SAFETY AND HEALTH REGULATIONS SET ASIDE BY COURT

Yesterday's papers also reported that the government will let stand a court ruling that invalidated proposed workplace standards for nearly 400 hazardous substances, ranging from carbon monoxide to wood dust. In their place, OSHA will have to rely on generally weaker standards voluntarily set by industry, before OSHA even existed. Among other things this means, according to one OSHA official reported by the Washington Post, it is now perfectly legal for a worker to die from carbon monoxide poisoning, having been exposed to levels that fall within OSHA's acceptable limits.

THIS LEGALIZES SOME FATAL WORKPLACE EXPOSURES

For 1,3-butadiene, a widely used material in the rubber industry, which is also a gasoline additive, the current standard to which a worker may legally be exposed 5 days a week for 40 years is greater than the level at which animals develop tumors in two years. For n-hexane, a solvent, which is also a gasoline additive, the current standard allows workers to be exposed to levels known to cause permanent nerve damage in both humans and animals. Something is terribly wrong with laws that have allowed these sorts of risks to go unchecked.

SOME INDOOR ENVIRONMENTAL EXPOSURES CAN BE DANGEROUS

Most environmental exposures involve levels that can be hundreds of even thousands of times lower than those in the workplace; and many chronic diseases can take 10 or 20 years to develop. Yet, another example of underregulated risks occurs when the same compounds that are

used in the industrial workplace are brought into homes where exposures can be as high as the factory. Household use of pesticides, solvents, degreasing agents, and other cleaning agents can produce high exposures and may be causing serious public health problems. About 7% of all pesticides are used in homes. At first this may not sound like a lot, but think of this. The typical user of a pesticide in a home may be working in a small enclosed space, and without protective clothing. Moreover, the chemicals may be used in areas near food and may be used repeatedly. Thus, a homemaker may legally apply a pesticide in his home, which a certified applicator cannot use without donning a space suit. For instance, no-pest foggers and fumigants are set off by using bombs in homes that provide continuous spray for several hours.

Other pesticide exposures that can be higher than those that occur in farmers can occur on golf courses. Golf course attendants and early morning golfers can also incur exposures to lawn chemicals which are as high, if not higher, as those of farmworkers.

BANNED PESTICIDE INGREDIENT IN CHILDREN'S PRESCRIPTION SHAMPOO LINKED TO BRAIN CANCER IN CHILDREN AND LYMPHOMA IN FARMERS

Still other uses of pesticide-like chemicals occur with some pharmaceutical agents. Further, it is legal today for parents to shampoo the heads of their children with a prescription medication for head lice, which is banned as a residue on raisins. This shampoo, called KWELL, contains lindane, a highly toxic compound that cross the barrier between the blood and the brain, and induces cancer and other diseases in animals. If you put lt on your dog, you are directed to wear elbow-length gloves, waterproof apron and boots, but if you put it on your child no such advice is given. A recent human study published by Jaines Davis and colleagues in the Archives on Environmental Contamination, 1993, found that children on whom this shampoo had been used, contracted significantly more brain cancer than children who were not exposed. According to studies by Aaron Blair, Ken Cantor, and Sheila Zahm at the National Cancer Institute, farmers who have worked with lindane have higher rates of lymphoma; and those who fail to use protective clothing having the highest rates.

Thus, there is evidence that these underregulated exposures are neither trivial in level, nor in their consequence.

SOME TYPES OF CANCER INCREASED IN FARMERS

As you are aware, my colleagues, from some of the world's leading cancer registries and 1 have reported in a series of articles and monographs that we have found persisting, mystifying patterns of cancer increases in industrial countries, that cannot be chalked up to smoking, improved diagnosis or aging of the population. We are teasing through data looking for clues about what could lie behind these trends.

I want to release to the committee today the results of a study that is being published in volume 100 of the journal Environmental Health Perspectives, in honor of the important contributions to Dr. David RaIl to environmental health research. With colleagues from the

National Cancer Institute and the Medical University of South Carolina, l combined results from 20 different studies of farmers in 8 countries and found some surprisingly common results. The good news is that farmers consistently die less often of heart disease, colon cancer, and lung cancer, probably due to their lower rates of smoking, higher exercise patterns, and better diets. The bad news is that they die more often of prostate cancer, multiple myeloma, melanoma, NonHodgkin's Lymphoma, kidney cancer, and brain cancer.

SAME TYPES OF CANCER THAT ARE INCREASED IN FARMERS ARE ALSO INDUSTRIAL COUNTRIES

Of special concern to my colleagues and me is the fact that the same types of cancer that kill farmers in increasing rates are also killing people in the general population of several major industrial countries. We do not know the reasons for these changes. But we sure had better find out. Could it be that exposure to engine exhausts, solvents, pesticides, or animal viruses play a role in both cases? Certainly evidence on the hazardous constituents of gasoline and fuel vapors is clear. Gasoline includes benzene, n-hexane, 1,3-butadiene, and other known human toxicants.

As Dr. Rall has illustrated, there are a number of confirmed ˜mdn 'arcinogens in the mix of vapors now in gasoline. We need to ask whether these play some role in recent trends?

ANIMAL SENTINELS OF ENVIRONMENTAL POLLUTION

As the panel has told you, it is very hard to get solid evidence that a particular environmental exposure to low ambient levels has affected human health. People move around, eat varied diets, pay the mortage in times of stress and recession, arid are quite different from pure-bred, highly-dosed, laboratory animals. But, a promising field of inquiry that uses evidence on common environmental exposures has produced a number of tantalizing clues that may be useful. Studies of animals in the environment exposed to low-levels of pollutants offer some intriguing clues.

Studies of companion animals, food animals, and wildlife have detected death and disease linked to current exposures over their natural lifetimes. Thus, we know that dogs, whose homeowners use lawn chemicals with the widely used pesticide 2-4-D in them contract more cancer than dogs without such exposures. We know that fat dogs dipped in flea dip also develop more cancer than unexposed ones. Recently, dogs have been shown to have an increased risk of lung cancer, if their owners smoke, with shorter-nosed dogs having higher risks than longer-nosed dogs. One study in Maryland found a similarity between the type of tumors found in animals and the types found in their owners.

WE REJECT THE NOTION OF FIXED LEVELS OF SICKNESS

It is time to challenge the accepted assumption of fixed levels of sickness or pathology in our society. As Lorenz Ng, and l argued in our book, in 1981, Strategies for Public Health.

We propose that the incidence of the current major causes of death and disease can be significantly reduced by developing social and economic incentives for health. We accept the argument that a substantial portion of major illnesses is controllable or preventable by changes in both lifestyle and the environment. The learning and practice of health promotion behaviors for individuals, corporations, health care providers and the government could result in reductions in morbidity and mortality. Strategies for producing such changes could effectively produce great economic and social savings by reducing demands for acute and chronic health care, increasing the potential labor force and GNP, and vastly improving the quality of life. (p4)

It has become commonplace to note the change in leading causes of mortality from infectious diseases at the !urn of this century to chronic degenerative diseases and accidents today. What is less commonly recognized is that two very different sets of health problems emerge, given these changes: 1) how best to manage those who now have generative chronic diseases; and 2) how best to prevent these diseases from developing in others. (p5)

As medicine become established as a science at the turn of this century, the emphasis in American public health circles shifted to treating illness, rather than to preventing them. The successes of immunization in controlling previously devastating infectious diseases, fostered the notion that all disease could be eradicated, by similar efforts. The key challenge became--as it remains today--find the right drug or device-the right plan of attack.

We have reached the point in the history of medical science, where most experts acknowledge that the triumphs in treatment and cure of most of the common infectious disease do not necessarily portend similar triumphs for the more insidious, and multiply-caused, common chronic diseases of an aging population. Some disease will be an inevitable consequence of aging, of course. But, much still should be preventable, for reasons 1 will outline below.

As Drs. RaIl and Colburn have detailed, there are several distinct kinds of evidence that science can use in order to further efforts to identify opportunities for disease prevention and link environmental factors, broadly conceived, with public health. Experimental animal studies provide the best controlled information, but sometimes may not be directly relevant to human health. Human studies have often been depicted as the best evidence, from the scientific viewpoint alone. But to rely solely on such evidence in order to make public policy decisions introduces a major ethical hurdle. For proposed new chemicals, to insist on acquiring human evidence, means treating uninformed humans as experimental subjects--something outlawed since Nuremberg. Moreover, for long-established chemicals in the environment, human evidence is often hard to come by, given the nature of information required to make the determination.

EVIDENCE ON THE LINK BETWEEN THE ENVIRONMENT AND HUMAN HEALTH

Still, where evidence of human harm can be obtained, it offers an important part of the puzzle regarding environmental health promotion

and disease prevention. Well-done studies in environmental epidemiology provide a critical tool to efforts at primary prevention. The National Research Council issued volume I Environmental Epidemiology: Public Health and Hazardous Wastes, in 1991, to lay the intellectual groundwork for this vital field. Environmental Epidemiology is a term of recent vintage that connotes studies of the impact on human health of physical, chemical, or biological factors in the external environment broadly conceived. The term may be defined as the study of specific populations or communities exposed to different ambient environments, so as to clarify the relationship between such factors and human health.

This report noted that:

"Part of our modern heritage is an unprecedented volume of wastes created by all modern societies. Since the earliest days of industrialization, substantial volumes of waste materials have been produced and sometimes disposed of in ways that create new problems for later generations. In the U.S. more than six billion tons of waste are produced annually, or some 50 x 10(3) per person. Serious national and international efforts are underway to reduce these quantities.

In the early stages of industrial expansion, wastes were generated on site and swept, sent, or poured "away." Occasionally, "away" meant literally out of the plant door, into the street, or into local pot-bellied stoves or community incinerators. Sometimes waste materials were sold as fill for uneven grounds and spread over large expances of unsettled, later urbanized land. Other times waste oils were used as dust suppressants. Often unneeded products were poured down the drain, or directly or indirectly placed into streams, rivers, lakes, and oceans.

In most industrial countries, a number of highly publicized episodes of pollution have made it clear that pollutants sometimes migrate in complex and not completely understood ways. Sending something "away" removes it from its immediate location to another space, but does not ensure that public health and the environment will be secure from exposure. Accordingly, policies are being developed to provide better waste disposal practices, through a variety of state and federal laws. However, the legacy of past practices provides a series of difficult challenges to policy makers and scientists today, regarding how to analyze the public health and environmental effects of these practices and how to set appropriate policies to reduce future harms."

The National Research Council Committee noted that one or the more challenging questions confronting the scientific community remains how to accurately estimate the health effects that may be associated with past patterns of disposal of hazardous chemicals and those future effects that may occur due to proposed remediation plans. This encapsulates the dilemma for the entire field, in that epidemiologic studies provide confirmation of past risks, but seldom suggest ways to avoid future risks. Since all the major methods of epidemiology are essentially observational and non-experimental, drawing inferences about causation is considerably more difficult than in experiments that

utilize randomization and controls. People move around, eat different foods, engage in different social and recreational activities, have different genetic backgrounds, and live their lives with the full diversity of the human experience. Yet, all these factors may directly or indirectly influence their health status at any given time. To sort out the relative role of such factors, epidemiologists, like other scientists of human events, must rely on inductivist methods for drawing inferences about their data.

Our entire health care system has focused heavily on treatment and screening and now finds itself forced to grapple with the harder less glamorous side of figuring out how to keep people well. How do we go about sorting out how to prevent disease and why do we think it is even possible? The evidence that some chronic disease can be prevented comes largely from epidemiologic studies that have found major differences in the rates of these diseases in different populations or countries. Thus, breast cancer is five times less common in Japan than the U.S. Prostate cancer is three times more common in Sweden than the U.S. Arthritis appears to be rare in some native populations, as does Alzheimer's Disease. Lung cancer in women varies by nearly 40-fold in countries like China and Romania, where very few women have been smoking. For these and similar instances, we need to figure out how to prevent chronic diseases that are growing in importance, by actively seeking information on their potential environmental causes.

CHALLENGES OF EPIDEMIOLOGIC RESEARCH

When it comes to identifying preventable causes or factors, epidemiology faces a number of important constraints. One of the fundamental dilemmas for epidemiologic research on hazardous waste sites, or any other topic involving multiple causes and multiple outcomes, derives from the fact that the statistical correlation of variables does not necessarily indicate any causal relationship between them. Mere coincident occurrence of variables says nothing about their essential connection, as has been well known to statisticians since at least David Hume's time. Moreover, partial correlations between variables that exclude other relevant variables can be misleading. To all these valid reservations, all the best scientist can bring to bear is considered professional judgment. The bottom line of any finding must remain: does it make plain sense? is it consistent with what we know about basic biology? have others found similar results? The answers to these questions take together provide the total picture in making inferences about causality in epidemiology.

An especially relevant tool for generating hypotheses about shifting causes is the assessment of patterns of incidence and mortality for major chronic diseases. These shifting patterns between and within countries or special populations can reveal successes or failures of treatment, indicates likely future demands for medical care, and also offers clues about shifting preventable causes of disease. Because patterns of chronic disease vary substantially from country to country and change as people migrate, experts believe that a substantial segment of these diseases may be avoidable. Exactly how much preventable disease occurs and the relative importance of different contributing causes remain matters of intense interest.

Thus, while cigarette smoking comprises the single most important, known cause of cancer and other chronic diseases today, about 70% of cancer is not generally linked to smoking. An essential piece of the prevention puzzle will be generated by research on how to reduce the rates of these diseases by figuring out how to keep people from getting sick in the first place.

Concerning cancer and heart disease, there is good news and bad news to report, as we have noted elsewhere. The good news is that improved treatments continue to reduce cancer mortality in persons under age 45 and cardiovascular mortality in persons over age 45. The bad news is that in all age groups cancer incidence is increasing.

PATTERNS OF DISEASE

In major industrial countries, a number of diseases linked to smoking and alcohol are declining in white men, such as heart disease. But, despite impressive reductions in smoking in men, a number of other chronic diseases are increasing beyond what we would expect due to aging and smoking patterns. Thus, in 1973 about 1 out of every 5 deaths in persons ages 65 to 74 was due to cancer; this year that number will be nearly 1 in 3. Asthma deaths in teenagers, especially blacks, have increased several fold, as have general emergency room admissions for adult and childhood asthma. For most birth defects--as tragic as these are for the families involved--we have no idea what their causes may have been. As to lead poisoning, we are left with a preventable epidemic of growing proportions.

CANCER PATTERNS IN INDUSTRIAL COUNTRIES

Mortality

We have examined trends in cancer death, or mortality, and cancer incidence, or new cases, in a series of papers published in Lancet, the Annals of the New York Academy of Sciences, and the Journal of the National Cancer Institute. Colleagues from 20 countries have reported increases in cancer deaths, or mortality, that cannot be explained solely in terms of aging, changes in coding, or access to care. Misclassification or miscoding of causes of death is also not a viable explanation, according to detailed technical analyses that we have published over the past decade. We are left with unexplained increases in a number of forms of cancer, including: multiple myeloma, prostate cancer, breast cancer, brain cancer, non-Hodgkin's Lymphoma, kidney cancer, testicular cancer, and general cancer with site unspecified.

This last category is of some note. If deaths due to general cancer of unspecified site had DECREASED in a given age group, while specific sites of cancer had INCREASED, this might suggest that a shift in accuracy of coding was the chief explanation; thus, some artefact in the data could be accounting for recorded increases in specific sites. In fact, in six industrial countries, we have found that nonspecific cancer has increased as a recorded cause of death, along with the specific causes of cancer listed earlier.

When it comes to figuring out what lies behind these continuing

increases in some forms of cancer, we are left with a complex, tantalizing and unsolved puzzle, with lots of tantalizing clues.

Of special note regarding lung cancer, is the fact that it has increased in women in populations outside of the U.S. where very few women smoke. Thus, in Hong Kong and Singapore, increasing rates of lung cancer in women probably indicate some other environmental factor at work. In Romania and in China, the rates of lung cancer in women vary by as much as 40-fold, despite the fact that women in these countries have traditionally smoked very little. Environmental pollution, including use of domestic cooking fuels, are prime suspects in this situation.

Incidence

As to cancer incidence, there are growing indications that problems are continuing in the U.S. and in other countries, such as Sweden. In the Journal of the National Cancer Institute, March 4, 1992, David Hoel and colleagues reported that although mortality from cancer had dropped in younger persons, new cases, or incidence continued to increase at all age groups from 1973 to 1987. The great bulk of these growing types of cancer cannot be linked to cigarette smoking. In fact, lung cancer has begun to decline in men, due largely to their reduced rate of smoking. Thus, these increases in new cancer cases are especially troubling, as they must stem from factors other than smoking and augur increased demand for health care and treatment. Excepting the relatively rare diseases of young children and young adults, most cancers are not curable. Even if they were, we already cannot afford to provide equitable cancer treatment.

A study just published today in the Lancet, the world's oldest medical journal, gives further urgency to the need to identify preventable causes of cancer. Distinguished Swedish cancer researchers have reported that younger persons in Sweden have three times the rate of developing cancer, when compared to older persons. These increased risks are not due to smoking-related-cancer, but to others. The authors conclude that: carcinogenic hazards in addition to smoking need to be aggressively sought and may have increased in recent decades in Sweden. We are conducting similar analyses in the U.S., with parallel results, that we expect to report within the month.

Thus, we are left with unexplained increases in cancer that cannot be attributed solely to smoking or to aging. This point is something that Richard Doll and I, along with colleagues at the NCI now agree on, according to recent conversations that we had in Washington this fall at the American College of Epidemiology meetings. We need to do a better job of figuring out what could lay behind these recent patterns of disease, as well as what could explain the continuing increases in other chronic diseases for which no new causes have been identified.

For cancer alone, we cannot afford to short our investments in primary prevention of the disease. The best way to ensure that a person does not die of cancer is to avoid contracting the disease in the first place.

As to these persisting puzzling patterns of cancer, I want to share with you the results of a study that is about to be published in the journal Environmental Health Perspectives with colleagues from the National Cancer Institute and the Medical University of South Carolina. We combined the results from 20 different studies of farmers in 8 countries and found some surprisingly common results. The good news is that farmers consistently die less often of heart disease, colon cancer, and lung cancer, probably due to their lower rates of smoking, higher exercise patterns, and better diets. The bad news is that they die more often of prostate cancer, multiple myeloma, Non-Hodgkin's Lymphoma, kidney cancer, and brain cancer.

Of special concern to my colleagues and me is the fact that the same types of cancer that kill farmers in increasing rates are also killing people in the general population of several major industrial countries. We do not know the reasons for these changes. But we sure had better find out. Could it be that exposure to engine exhausts, solvents, pesticides, or animal viruses play a role in both cases? Certainly evidence on the hazardous constituents of gasoline and fuel vapors is clear. As Dr. Rall has illustrated, there are a number of confirmed human carcinogens in the mix of vapors now in gasoline. We need to ask whether these play some role in recent trends?

BREAST CANCER AND SUSPECT TOXIC CHEMICALS AND PESTICIDES

Since antiquity, removal of a cancerous breast has been part of standard medical treatment. Prevention of this most common cancer for women in industrial countries today remains more elusive. The increase in breast cancer in the industrial world is particularly striking (Kohlmeier, 1990). Three decades ago, 1 in 20 American women developed breast cancer by age 85. Today the disease afflicts one out of nine, robbing them on average 20 years of life. In the U.S. nearly 50,000 deaths each year from breast cancer result in the loss of about a million years of life(NCl, 1992). The U.K. Cancer Research Campaign reports that over half a million European women develop breast cancer each year(U.K. Cancer Research Campaign, 1992).

As founding Coordinator of the Breast Cancer Prevention Collaborative Research Group, I have worked with colleagues from the U.S. National Institute of Environmental Health Sciences, the National Cancer Institute, and Health and Welfare Canada, in developing some testable theories about this most common cancer in women, which have been reported in Lancet, October 10,1992. Following years of puzzling, steady increases in breast cancer, public health researchers are rekindling interest in the role that toxic chemicals, such as organochlorines, could play in the development of the disease. Do such substances increase breast cancer risk by directly or indirectly altering estrogen production or metabolism? Do they activate or promote breast cancer susceptibility genes?

Worldwide, half of all cases occur in North America and Europe, which contain less than one-fifth the world's female population. (Parkin et al., 1989). Rates in Japan are five times lower than those in many developed countries (Davis et al., 1990). Known risk factors for breast cancer account for less than 30% of the cases. Over the

years, epidemiologic and experimental studies have linked a number of risk factors with cancer of the breast. These include age, and ages at menarche, menopause, radiation, and first full-term pregnancy, diet, obesity, total calorie intake, family history, and alcohol intake (House of Commons, 1991). But, most breast cancer cases come from low-risk sub-groups.

What accounts for the remaining 70% of breast cancer for which causal factors are unknown? Direct, hormonally related factors that increase lifetime estrogen are involved in most of these, but other agents such as total alcohol and calorie intake may modify estrogen metabolism, thereby increasing the risk of the disease. Studies in animals have identified a number of pesticides and toxic chemical compounds as suspect carcinogens over the past three decades, including DDE, PCB, and atrazine. More recently, studies have found that the breast fat of women with breast cancer has almost twice the levels of some chlorinated pesticides such as metabolites of DDT (Falck et al., 1992), and about 3 times the levels of hexachlorocyclohexane (HCB) (Mussalo-Rauhamaa et al.,1990) relative to controls. Furthermore, another study has reported a temporal association between a decrease in population exposure to organochlorines and a reduction in breast cancer mortality rates (Westin and Richter, 1990). Within a year, the breast cancer susceptibility gene(s) should be discerned. This will yield important opportunities for epidemiologic study of the xenobiotic factors that activate or promote these genes. Could organochlorine compounds be among those involved?

Many risk factors for breast cancer entail effects which alter the production and metabolism of estrogen. For example, the total amount of fat (calories) in the diet may increase levels of steroid hormones. A high fat diet may also alter the metabolism of estrogen in the gut, while a high fiber diet, along with greater physical exercise, may reduce enterohepatic resorption of fecal estrogens. Increased alcohol consumption and obesity also increase blood levels of estrogen. (Westin and Richter, 1990).

Diets high in naturally occurring anti-oxidants also reduce the circulating levels of harmful estrogens. Exposure to some foreign compounds can directly or indirectly elevate endogenous hormone levels by affecting estrogen metabolism. Women with breast cancer have been found to exhibit a marked increase in 16-a hydroxylation of estradiol when compared to those without the disease (Telang et al., 1992). One possible link between alcohol consumption and increased breast cancer may be the fact that ethanol has been shown to induce P4S011E, a subfamily of enzymes that may affect other potential carcinogens.

Regarding prevention oriented research, we cannot afford to wait until the causes and mechanismS of breast cancer are fully understood. Disease can be prevented even before the otiology has been articulated. One of the most common responses to early reports that tobacco smoking causes lung cancer is instructive. Some scientists argued--a mere 30 years ago that lung cancer could not possibly be caused by smoking, because no mechanism could be imagined. Moreover, others contended that the recorded increases in lung cancer were chiefly an artefact of

improved reporting attributable to improved medical diagnostic technology.

Throughout the industrial world breast cancer has continued to increase during the past few decades (Hoel et al., 1992). In order to devise primary preventive strategies that reduce the rate of breast cancer, epidemiologic research needs to be constructed that takes advantages of the clues produced by evolving developments in genetic, viral, and chemical carcinogenesis. As suggested by the recent Cuernevaca workshop, research strategies for the epidemiology of breast cancer should begin to incorporate and validate emerging advances in research on biologic markers of early processes in breast cancer pathophysiology along with markers of exposure to suspect xenobiotic materials.

MEN MAKE BABIES

Drs. Colburn and RaIl have documented the subtle, extensive effects that toxic chemicals can have on critical body functions and processes. Thus, it is not surprising to learn that these effects extend to endpoints not customarily thought of as vulnerable. In particular, recent attention has renewed interest in the importance of fathers for the types, sizes, and kinds of babies that they produce. Reflecting growing evidence that paternal exposures are key, the March of Dimes announced its "MEN MAKE BABIES" campaign, which highlights information about the potential hazards to the unborn from fathers who use drugs, alcohol, or hazardous workplace materials.

THE COSTS OF MISTAKES

While many observers argue that the costs of falsely regulating innocent chemicals are quite high, at least one analyst, Carl Cranor of the University of California, suggests that the costs of failing to regulate hazards are significantly greater.

Cranor argues that in general, we do not necessarily need more and better, and slower and more costly science. Rather, we need to make better use of decision rules for evaluating existing information relevant to the growing backlog of regulatory matters. We need to engage in a serious national discussion on whether environmental policy should "place greater urgency on avoiding false negatives and strike a better balance between false positives and false negatives than present practices appear to." (178)

If we have any hope of improving our current approach, we have to rethink the kinds of evidence that we have required as a basis for regulatory action. And we have to forge regulatory and scientific institutions in which people can have confidence.

Mr. Chairman, you asked me last week whether we were devoting adequate resources to the right problems in the environment. I do not presume to have the full answer to your important question, but l think the examples I have mentioned, along with some others noted by the witnesses here today and in the Times series, indicate that it all depends on what problems you have in mind. Regarding public health, we

have to move into providing protection against environmental causes of non-fatal diseases, like lead poisoning and other neurological or reproductive problems, that do not kill but do diminish the quality of life. As to cancer, we need to focus more resources on the entire range of relevant exposures. Those of us who care deeply about these issues will have a lot of work to do for some time to come.

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StonyBrook

April 5, 1993

The Honorable Senator Max Baucus
Chairman
Senate Environment and Public Works Committee
456 Senate Dirksen Building
Washington, DC 20510-6175

Dear Senator Baucus,

I am writing to protest the large expenditures for environmental protection which our present Congress and Environmental Protection Agency (EPA) are spending to protect the environment from destruction and pollution without in fact achieving their stated goals.

I am a Professor of Medicine Emeritus at State University of New York at Stony Brook who has been Director of the Environmental Science Center at the State University of New York from 1984 to 1990, at which time I retired from my administrative appointments at the University. I obtained the Ph.D. in biochemistry from St. Louis University in 1944 and the M.D. from Harvard Medical School in 1951. I interned at the Peter Bent Brigham Hospital in Boston, Massachussets from 1951 - 1952. I am licensed to practice medicine in the states of New York and Pennsylvania and am a member of the American College of Physicians which includes most physicians certified in internal medicine. I have held academic appointments at Harvard, University of Pittsburgh, St. Louis University, and most recently the State University of New York at Stony Brook. My research work has dealt principally with studies of metabolism, endocrinology, pharmacology, toxicology, and nutrition in both animals and humans. While at St. Louis University, I directed a clinical research center for the study of anemia and malnutrition in Chiang Mai, Thailand with the support of the National Institutes of Health of the U.S., the Rockefeller Foundation, and the Thai government. During my career I have had the opportunity to serve as an advisor to the U.S. government as a member of the USPHS Division of Research Grants and the Advisory Council of the National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases. I have been a member of a variety of editorial boards in my field of medicine and have published approximately 300 scientific papers in peer-reviewed journals. I am writing as a medical scientist and practitioner of medicine and public health to criticize the wasteful program of the EPA.

In general the Environmental Protection Agency has concentrated on problems that do not constitute a significant risk to the health of Americans and ignored problems that do affect the health of Americans. I would like to comment on two major legislative initiatives which have

led to the waste of an extraordinary amount of money because the assumptions upon which they were based. The first is the the Comprehensive Environmental Response, Compensation and Liability Act which became law under Jimmy Carter in 1980 and authorized the creation of the Superfund with a budget of $1.7 billion per year. The objective of this legislation was to clean up hazardous waste sites which were reported to be a serious public health problem. More than ten years have elapsed since the Superfund was created and as yet there is no evidence that the designated waste sites were a source of illness in the first place, or that the clean-up which has cost $16 billion so far has improved our public health statistics. Where is the clinical disease? Where are the death certificates?

Dr. Joseph Grisham of the University of North Carolina and several colleagues from the American Society of Investigative Pathology, did a survey of the health effects of 25 hazardous waste sites in the 1980's and found no evidence of disease attributed to these sites in the surrounding populations. Scientific papers claiming health effects from these sites are flawed by inadequate methods, inaccurate conclusions and have not been validated by subsequent studies. Even such notorious sites as Love Canal in New York or Times Beach in Missouri have not been proven to cause any identifiable disease except emotional panic in the inhabitants of these communities. The National Cancer Institute can not identify a single person who has cancer as a result of exposure to a waste site, nor does the EPA have any evidence relating morbidity or mortality to these sites. If the program is allowed to continue, the cost to fund the clean-up of the remaining 2,000 sites is estimated to be $80 billion without any evidence that such exorbitant expenditures will improve the U.S. public's health.

In addition to the waste of money already spent to attack a phantom disease causing unknown mortality and morbidity rates, roughly 500 lawsuits have been filed during the period of the last administration. It is estimated that in 1991 $500 million were spent in legal costs to obtain $1.4 billion in clean-up commitments. As the mood of chemical industry shifts from compliance to resistance, the cost to the taxpayer will increase further as he pays for litigation as well as clean-ups which achieve no health benefits for him.

Another impediment to good science in pursuing environmental protection is the Delaney Clause which was an amendment to the Food, Drug and Cosmetic Act in 1959. This legislation requires that any synthetic food additive which causes cancer in any animal in any amount should be banned from the food supply. Not only is the Delaney Clause still dominating FDA food additive policy today but Delaneyism has extended beyond the FDA to dominate all federal edicts relating to environmental chemicals. One fallacy in this unwise legislation is to create a dichotomy between natural and man-made chemicals assuming that natural compounds do not cause cancer whereas synthetic compounds do. Contrary to this assumption, it is now clear that the cancer risk in the American diet is due to natural chemicals which occur in the food supply including dietary fat.

Furthermore the evidence for carcinogenicity of added chemicals is based upon the extrapolation of cancer rates in rodents fed enormous

concentrations of these chemicals (some one million times the levels in our food supply) to man.

The relationship between the high levels of additives used in carcinogenicity tests in animals and the low levels present in the food supply is estimated by the linearized multistage formula, which has never been validated by direct scientific evidence. The extrapolation accomplished by the linearized multistage formula, furthermore, is very conservative in that the estimated risk is at the highest possible level, i.e. the 95th percentile when as EPA admits, it may be zero. For example, the EPA in 1987 calculated that fungicides, insecticides and herbicides applied to foods could account for the total 2.9×10^{-3} risk (2.9 out of 1,000 persons) or 4% of the total cancer mortality in this country in 1 year. On the other hand, Sir Richard Doll of Oxford puts the cancer risk of pesticides and other food additives at less than 1% and Dr. Robert Scheuplein of the FDA puts the risk even lower at 0.01%.

This over estimation of risk characterizes all of the extrapolations which the EPA has done from rodent assays. Compounds which have been banned on the basis of rodent assays which appear to be innocuous to humans at the doses to which humans have been exposed include saccharin, cyclamates and a variety of pesticides including alar, the growth promoter used on apples. This policy of banning chemicals from the food supply at the "drop of a rat" is costly to both taxpayers and industry, without improving the safety of the food supply one iota.

In conclusion, I cite the above facts to indict the Congress and the EPA for mismanagement of environmental policy. They have systematically overestimated the risk of various environmental factors and then misappropriated funds to remove such materials from the environment when in fact there is no evidence that these substances affect the health or welfare of a single human being. On the other hand virtually no funds are expended by the EPA to reduce cigarette smoking, illicit drug use, venereal disease, microbiological contamination of foods, and heavy metal contamination of food and water supplies. Furthermore, the National Institutes of Health are spending only $2 billion per year to combat such major threats to public health as heart disease and cancer.

It is time for a change. I strongly recommend that your Committee attempt to redirect environmental policy in this country toward <u>real</u> protection of our people.

Very sincerely yours,

Robert E. Olson, M.D., Ph.D.
Professor of Medicine Emeritus

REO:ld

[From the New York Times, March 21, 1993]

New View Calls Environmental Policy Misguided

By KEITH SCHNEIDER
Special to The New York Times

WASHINGTON, March 20 — A generation after the United States responded to poisoned streams and filthy air with the world's first comprehensive strategy to protect the environment, many scientists, economists and Government officials have reached the dismaying conclusion that much of America's environmental program has gone seriously awry.

These experts say that in the last 15 years environmental policy has too often evolved largely in reaction to popular panics, not in response to sound scientific analyses of which environmental hazards present the greatest risks.

As a result, many scientists and public health specialists say, billions of dollars are wasted each year in battling problems that are no longer considered especially dangerous, leaving little money for others that cause far more harm.

At First, Clear Benefits

In the first wave of the modern environmental movement, starting about 30 years ago, the focus was on broad efforts to eliminate the most visible pollution pouring from smokestacks and sewer pipes — programs with clear goals that had obvious benefits.

But a second wave began in the late 1970's, with a new strategy intended to limit visible pollution further — and to begin attacking invisible threats from toxic substances.

To that end, state and Federal governments began writing sweeping environmental laws, some of which included strict regulations to insure that certain toxic compounds were not present in air, water or the ground at levels that did not exceed a few parts per billion, concentrations that could be measured with only the most sophisticated equipment.

The result was a tangle of regulations that the Environmental Protection Agency estimates cost more than $140 billion a year, roughly $100 billion spent by industry and $40 billion by Government.

But what is now becoming apparent, some scientists and public health specialists say, is that some of these laws — written in reaction to popular concerns about toxic waste dumps or asbestos in the schools, as examples — were based on little if any sound research about the true nature of the threat. Since 1980, for instance, thousands of regulations were written to restrict compounds that had caused cancer in rats or mice, even though these animal studies often fail to predict how the compounds might affect humans.

What Price Cleanup?

First article of a series.

And with rare exceptions, Congress approved new laws without subjecting them to even rudimentary cost-benefit analyses. One reason was that during the 1980's, when the economy seemed healthier, there was far less pressure on Congress to consider the cost of environmental policy.

Overpriced and Misguided?

Now a new Administration intent on strengthening environmental policy is settling into office when competition for scarce financial resources is keen. At the same time, a wealth of new research shows that some of the nation's environmental protection efforts are excessively costly — though no one knows how much of this money is misspent — and devoted to the wrong problems.

This view is the vanguard of a new, third wave of environmentalism that is sweeping across America. It began in the late 1980's among farmers, home owners and others who were upset largely by the growing cost of regulations that didn't appear to bring any measurable benefits. Corporate executives had long been making similar arguments but had gone unheeded, even during 12 years of Republican rule, because often they were seen as interested only in saving money.

Richard J. Mahoney, chairman and chief executive of Monsanto, the chemical company, said the nation may start listening to industry now.

"People want to know, even with the environment, what we are getting for our money," he said. "The most positive thing since the election is that we are beginning to recognize that we do have finite resources, and one must make choices."

But leaders of the nation's conservation organizations believe the new view is misguided.

"We don't need a new paradigm," said David D. Doniger, a senior lawyer with the Natural Resources Defense Council. "For 35 years, the policy of the Government has been that when there is uncertainty about a threat it is better to be safe than sorry. When you are operating at the limits of what science knows, the big mistake would be to underestimate the real danger and leave people unprotected."

Still, in the last few years the wave has moved into universities, city halls, state capitols and even to the highest levels of the E.P.A., whose Science Advisory Board in 1990 concluded that environmental laws "are more reflective of public perceptions of risk than of scientific understanding of risk."

Law Follows Panic

William K. Reilly, the E.P.A. Administrator at the time, agreed. And in a recent interview in his office at the World Wildfire Fund, he argued: "People have a right to expect that public officials are making the right choices for the right reasons. We need to develop a new system for taking action on the environment that isn't based on responding to the nightly news. What we have had in the United States is environmental agenda-setting by episodic panic."

Richard D. Morgenstern, the acting administrator for policy planning and evaluation at the E.P.A., explains the problem this way: "Our society is very reactive, and when concerns are raised people want action. The problem in a democracy is you can't easily sit idly back and tell people it would be better to learn more."

The result, he added, is that "we're now in the position of saying in quite a few of our programs, 'Oops, we made a mistake.'"

President Clinton is clearly aware of this view. As Governor of Arkansas, he continually complained as a Federal toxic waste cleanup project in Jacksonville devoured $25 million in state, Federal and private money. State officials said nearly a decade of work has produced little more than piles of technical documents, exorbitant legal bills and public discord.

To be sure, some of the $140 billion the nation is spending this year pays for environmental programs that are indisputably useful. As an example, few experts question the value of spending roughly $3 billion each year on new sewage treatment plants. Many experts, however, question the wisdom of spending billions of dollars to protect people from traces of toxic compounds. Unless the nation rethinks its approach to environmental protection, some experts say, the United States could repeat its mistakes.

"The President is aware of this dilemma, and there is leadership in this Administration for trying to change the way we do business in every aspect of governing, including environmental protection," said Carol M. Browner, the Administrator of the Environmental Protection Agency. "We have to allow for change to occur as new information becomes available. This is not an area where a solution will fit forever."

Policy Now

Costly Solutions Seeking Problems

Almost everyone involved, including community and local environmental groups, agrees that the toxic waste program stands as the most wasteful effort of all. It began 15 years ago when the nation rose in revulsion over the discovery of seeping chemicals at Love Canal in New York. Hundreds of people were evacuated from their homes.

In response, Congress passed two laws: the Superfund law of 1980 and amendments to the Resource Conservation and Recovery Act in 1984. A decade later, those laws have

driven the Government to spend almost $2 billion a year for the Superfund, which cleans up toxic waste sites, and more than $8 billion more a year on similar programs in other agencies, even though many of the sites pose little if any danger.

"Does it make sense to spend millions of dollars cleaning up a site that only has a tenth of an ounce of contamination?" asked Dr. Richard Goodwin, a private environmental engineer in Upper Saddle River, N.J., who has overseen more than 20 toxic waste cleanups. "I say no. All we're doing in most cases is throwing money at a problem without improving public health or the environment."

Hugh B. Kaufman, a hazardous waste specialist at the E.P.A. who helped uncover the problem at Love Canal, said that in the few cases in which a site is near populated areas, "the best thing we can do is evacuate people if they want, then put up a fence and a flag that says stay away."

Mr. Kaufman said he knows that his idea represents a marked change in the traditional view of how the nation should care for its land. But he and other experts says it does not make sense to clean up these wastes at costs that frequently exceed $10 million an acre.

Even a principal author of the Superfund law, Gov. Jim Florio of New Jersey, who was chairman of a House environmental subcommittee in the 1970's, now argues that the inflexible rules mean that Superfund resources are too often devoted to making sites pristine.

"It doesn't make any sense to clean up a rail yard in downtown Newark so it can be a drinking water reservoir," he said, speaking rhetorically.

Toxic waste cleanups are one example of a program gone awry. Here are others:

¶Early in the 1980's, Government scientists argued that exposure to asbestos could cause thousands of cancer deaths. Since asbestos was used as insulation in schools and public buildings, parents reacted with alarm. So in 1985 Congress approved a sweeping law that led cities and states to spend between $15 billion and $20 billion to remove asbestos from public buildings. But three years ago, the E.P.A. completed research that prompted officials to admit that ripping out the asbestos had been an expensive mistake; the removal often sent tiny asbestos fibers into the air. Now, except in cases when the asbestos is damaged or crumbling, the Government's official advice is: Don't touch it.

¶ In 1982, high concentrations of dioxin were discovered in the dirt roads of Times Beach, Mo., near St. Louis. Residents were alarmed; the Government had designated dioxin as one of the most toxic substances known. The furor came in the middle of a scandal at the E.P.A.; the agency's chief, Anne Gorsuch Burford, was accused of not enforcing environmental law and being too close to industry. And as that scandal dominated the news, the Reagan Administration decided to evacuate all 2,240 residents of Times Beach, a project that cost the Government $37 million. But new research indicates that dioxin may not be so dangerous after all. None of the former residents of Times Beach have been found to be harmed by dioxin, and two years ago, Dr Vernon N. Houk, the Federal official who urged the evacuation, declared that he had made a mistake.

Yet even as enormous sums of money were being spent on these problems, Washington was doing little about others. Here are two:

¶Mercury, a highly toxic metal, has contaminated thousands of lakes across the nation, poisoning wildlife and threatening human health, state environmental officials say. Twenty states, including New York, have posted warnings at lakes urging people not to eat the fish because they are tainted by mercury, which can cause nervous system disorders. But during debate on the Clean Air Act, in 1990, Congress considered limiting mercury emissions from coal-burning electric plants. The lawmakers decided not to act because they believed utilities had already been asked to spend enough to control acid rain, Senate and House leaders said.

¶In the last two years, several Federal agencies have called exposure to lead the largest environmental threat to the nation's children. Although some scientists dispute that, several studies have shown that lead poisoning in children leads to reduced intelligence, learning disabilities and hyperactivity. The problem is that most houses built before the 1970's could have some lead-based paint, and the fear is that children are eating paint chips or inhaling lead-laden dust. Some experts have said removing the lead paint will cost at least $200 billion. This year, the Government will spend $234 million on the problem, far less than it spends on cleaning up toxic wastes.

When Politics Mixes With Fear

Even the advocates of change acknowledge that as science evolves, experts may change their views again on the dangers posed by these and other substances. But at the least, "sound science should be our compass," as Mr. Reilly put it two years ago.

After all, it was politics, misinterpreted or inaccurate scientific findings and a newly influential national environmental movement that combined to set America down its present path.

During the 1970's, the United States had successfully dealt with many obvious environmental problems. When the Cuyahoga River in Cleveland caught fire in 1969, as an example, Congress passed the Clean Water Act. About the same time came the Clean Air Act, the Endangered Species Act and other landmark environmental statutes — laws that are now widely acclaimed.

By the late 1970's, many Democrats in Congress believed the public wanted even stricter environmental law. But when Ronald Reagan was elected in 1980, he promised to reduce regulation. While the White House and Congress battled over this, the national environmental movement, with help from the news media, took on the job of warning the public about new threats and creating campaigns to enlist popular support for new regulations. They were spectacularly effective at this, and Congress passed two dozen bills that laid down a welter of mandates.

In the 1970's, environmental statutes rarely ran more than 50 pages. In the 1980's, these bills seldom numbered fewer than 500 pages. The reason was that Congress wanted to mandate safety limits so specific that the Administration could not ignore or evade them. Mr. Reilly, the former E.P.A. chief, said he was largely unable to change the Government's thinking, despite his strong opinion that environmental policy was on the wrong course, because "this represented a pretty significant change of direction."

Legitimizing Pollution?

At the leading environmental groups, staff members dispute the developing view that environmental policy is off track.

"It's an effort to legitimize pollution," said Daniel F. Becker, director of the Global Warming and Energy Program at the Sierra Club. "There are powerful forces who have an economic stake in de-emphasizing environmental damage."

But others who analyze environmental issues said these groups are in danger of becoming the green equivalent of the military lobby, more interested in sowing fear and protecting wasteful programs than in devising a new course.

"We are in danger of losing credibility and thus losing public support if we don't modify the whole way we go about protecting public health and the environment," said Dr. Devra Lee Davis, a senior research fellow at the National Research Council of the National Academy of Sciences.

A Case Study

Making Dirt Safe to Eat

Perhaps no environmental program has come under more criticism than the Superfund and its progeny. The Federal programs to clear toxic or radioactive wastes will consume more than one-quarter of the roughly $38 billion that the Federal Government spends for environmental protection this year. Experts in and out of the Government assert, though, that the justification for these expenditures is often questionable.

Consider the case of Columbia, Miss. The E.P.A. is overseeing the last phases of a $20 million Superfund cleanup project there. Like many others around the country, this one was guided by the Government's assumption that children will eat dirt. Lots of it. And from that dirt, the Government theorized that they could develop cancer.

Some evidence suggested that this was an exaggerated concern. In 1981, a study for the Congressional Office of Technology Assessment, which has been endorsed by the National Cancer Institute, found that only 1 to 3 percent of all cancers in people are caused by exposure to toxic chemicals in the environment. This finding, however, has had little influence on Federal policy.

The problem in Columbia was an 81-acre site that over its long life had been home to a lumber mill, a naval turpentine and pine tar plant and a chemical manufacturer.

Soil tests taken in 1986 showed traces of compounds the Government defines as hazardous. The concentrations rarely exceeded 50 parts per million, or about two ounces of chemicals mixed in a ton of soil. But that level exceeded the Federal limit, and the E.P.A. placed the land on its list of dangerous toxic waste sites.

Some experts told the E.P.A. that such tiny amounts of contamination were harmless. They said the safest and most economical way to solve the problem would be to spread a layer of cleaner soil and call it a day. The cost: about $1 million.

But two years ago, the E.P.A. settled on the most expensive possible solution. The Government ordered Reichhold Chemical, the plant's former owner, to dig up more than 12,500 tons of soil and haul most of it to a commercial dump in Louisiana — 450 dump truckloads, each one costing $7,500.

E.P.A. officials said they wanted to make the site safe enough to be used for any purpose, including houses — though no one was proposing to build anything there. With that as the goal, the agency wanted to make sure children could play in the dirt, even eat it, without risk. And since a chemical in the dirt had been shown to cause cancer in rats, the agency set a limit low enough that a child could eat half a teaspoon of dirt every month for 70 years and not get cancer.

Last month, the E.P.A. officials acknowledged that at least half of the $14 billion the nation has spent on Superfund cleanups was used to comply with similar "dirt-eating rules," as they call them.

"I don't think any way you look at this it could be seen as a practical solution," said W. Scott Phillips, an engineer with Malcolm Pirnie, an environmental planning company that manages the cleanup. "It's a lot of money to spend moving dirt."

[From the New York Times, March 22, 1993]

Sea-Dumping Ban: Good Politics, But Not Necessarily Good Policy

By MICHAEL SPECTER

For millions of people from Montauk to Maryland, the broiling summer of 1988 will be hard to forget. It was the hottest year ever recorded. Repulsive trash slicks covered the Eastern shoreline. And borne upon a tide of public outrage, garbage emerged as a potent political issue.

In New York and New Jersey, where most of the waste appeared, health officials closed beaches by the score, depriving sweltering people of relief. Pictures of used syringes, dead dolphins and human excrement scattered across the sand became a staple of the news.

Anger required action. So without registering a single vote of opposition, Congress that fall banned the dumping of sewage into the ocean. The law prohibited New York City from dropping its processed waste into the sea and forced officials to find costly new ways to get rid of it.

The Rush to Ban

"This is a turning point in human history," said a euphoric Representative William J. Hughes, Democrat of New Jersey, after the vote. Other officials agreed, rushing to embrace the law as one of the most important environmental measures ever enacted.

There was just one problem.

Ocean dumping had absolutely nothing to do with the garbage that washed up on the sand that year. In fact, the problems that caused the mess on the beaches in 1988 — overtaxed sewage systems — were largely ignored, and the health risks they present are as serious as they have ever been.

Most scientists agree that using the sea as a garbage can was unpleasant and are pleased that it is no longer legal. But some argue that dumping sewage in the Atlantic Ocean 106 miles

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from the shore — which saved New York and other cities billions of dollars over the years — is less hazardous than most of the disposal methods that have replaced it.

But Congressional leaders, relying almost solely on the summer's vivid images of filth, pushed through a ban on ocean dumping. As Senator John H. Chafee, Republican of Rhode Island, put it immediately after the vote: "It is unfortunate that it takes a situation like we have today with medical waste washing up on our beaches, to capture the attention of the American public and of Congress. But perhaps it is a blessing in disguise, since it has resulted in our action today to put a halt to the ocean dumping of sludge."

Representative Thomas J. Manton, Democrat of Queens, opposed the act at first, saying it would simply shift waste from sea to land, including land in his own district. But looking back to that time, he recalled: "Nobody wanted to discuss the relative risks or the merits. It had been a bad summer, and we all wanted to be able to say we did something. So we passed a law. I tried to have a debate. And it was like I was trying to destroy the planet."

Because of the Ocean Dumping Act, New York City spent $2 billion on giant plants that turn processed sewage into fertilizer. The city plans to spend at least $300 million a year over the next decade to dispose of its sludge in this way and in others — many times more than it would cost to dump it in the ocean.

Better Ways to Spend

But even some of the ban's most enthusiastic proponents at major environmental organizations, none of whom would be quoted by name, concede that the money might have been better spent on other problems, like fixing the extensive system of storm sewers that caused the waste to wash up on the beaches in the first place.

Indeed, the ocean dumping ban is a striking triumph of environmental politics over science, a clear demonstration of how environmental policy can often be directed by symbols and fears than by reasoned discussion of benefit and risk.

In 1988, and still today, the real problem came from New York's aged, 6,200-mile network of sewer pipes that mix household waste with rainwater. Normally, it is all treated together. But during storms, sewage treatment plants are quickly overwhelmed, and sewer pipes carry millions of gallons of raw waste directly to the rivers and harbors surrounding the city.

In fact, in the summers since the ban on ocean dumping took effect, officials have closed beaches more often than they did before 1988.

"There is no question that the New York City sewer system is the greatest cause of water pollution in the region; that has almost always been true," said Howard Golub, acting director and chief engineer of the Interstate Sanitary Commission, a regional regulatory agency that for 20 years has been trying in vain to convince people to pay attention to the problem.

"But a sewer system isn't sexy," he added. "It's expensive to fix, and nobody wants to hear about it. So people focused on what they understand — and they understand that sewage and the sea don't seem nice together."

The Real Problem

Wallflower At a Political Dance

Modern sewerage usually consists of two systems: storm sewers that carry off excess rainwater, and sanitary sew-

ers that handle sewage that needs treatment. But older, combined systems, like New York City's, serve almost 20 percent of the nation's population, about 50 million people living in the America's oldest cities. For decades they have been the major cause of beach closings and dangerous levels of bacteria in coastal waters. They generally work well enough in normal times; sewage and ordinary storm drainage are treated together and then discharged.

During a heavy storm, however, so much water washes into the combined system that it is overwhelmed. The treatment centers cannot handle the load and everything — storm water and sewage — floods untreated out the pipe.

To solve the sewer problem, New York would have to build enormous subterranean tanks to hold waste water during heavy downpours, and the city Department of Environmental Protection says that could cost several billion dollars. Without them, many beaches in the area will continue to be closed after particularly heavy storms. Every time more than three-quarters of an inch of rain falls, 500 million gallons of mixed sewage pours into area rivers and harbors, the city says.

A report by the State University of New York estimated that sewage overflows cost New York and New Jersey $3 billion to $7 billion in lost jobs, lost fishing days and forfeited economic opportunities in the previous decade.

That report was published in 1988, just as the sewers were flushing syringes and other trash from streets and gutters onto the beaches. Still, almost nobody seriously questioned the need for an immediate ocean dumping ban.

Those who supported the ban now argue that two rights cannot make a wrong. They say that ocean dumping needed to stop and that bills get passed when they can, not always when they make the most sense.

"You take care of emergencies first in life and in politics," said Senator Frank R. Lautenberg, the New Jersey Democrat who was a leader in the fight to end ocean dumping.

Senator Lautenberg agreed that sewage overflows pose a serious health risk, but he added: "Sludge dumping was the equivalent of a fire we could put out. Just because you have earthquakes on the horizon doesn't mean you should let the fire rage."

Mr. Lautenberg asserted that it was not as clear in 1988 as it is today that storm sewers, not ocean dumping, were to blame for most of the trash that appeared on the beaches. But he did agree that the barges heading out to sea provided an image that was too useful to ignore.

"There is simply a point when you have to look at the broader picture," he said. "When we passed the law, it was at the height of a couple of ugly seasons. The waste may not have been a direct result of the ocean dumping, but it did alert people to the fact that we need to stop pouring garbage into the ocean."

Unsavory Practice

Where to Put A City's Sludge

Few people are genuinely unhappy about the demise of a practice in which 1.5 billion gallons of distilled sewage sludge was dumped each day 106 miles off the coast of New Jersey. Even those who say it makes sense to consider using the deep sea to store dangerous wastes acknowledge that the sludge was beginning to find its way into the food chain on the ocean floor.

And while most industrial waste, heavy metals and dangerous contaminants were removed from the sludge before it was dumped in the ocean, it was never possible to extract all the poisons found in a huge sewage system.

For decades, New York dropped its sludge only 12 miles off the coast — turning vast aquatic reaches into home to nothing but slime. Environmentalists fought for years to end ocean dumping. As a compromise, the Federal Government decided to permit New York and several neighboring cities to shift its dumping to the edge of the continental shelf, where E.P.A. officials said it would do no harm.

But even at 106 miles, where there is no scientific proof that waste disposal causes illness in humans, ocean dumping of waste has proven to be less than ideal. Although researchers first thought sludge dumped there would never reach the bottom of the ocean, scientists now know that some of it does. And when it gets there, it is eaten by animals that are eventually eaten by man.

Troubles Elsewhere

But scientists argue that it may be just as troublesome to dump the sludge anywhere else. Sludge in landfills can seep into ground water. Even beneficial uses, like turning sewage to fertilizer, costs millions in processing and shipping.

Whatever the ancillary benefits the ocean dumping ban may have offered, it also cost New York a great deal of money. And many officials now say that money could have been put to far better use by trying to resolve the more complicated — and pressing — dilemma caused by combined sewer overflows.

"Am I sad that we no longer dump sludge in the Atlantic Ocean? Absolutely not," said Albert F. Appleton, commissioner of New York City's Department of Environmental Protection. He has made clean water a major focus of his tenure. "In a perfect world we simply wouldn't dump our waste at sea. But is that how I would have spent our next $2 billion? Never in a million years."

Other Solutions

A Victory Draws Questions

Tough new laws passed since the mess of 1988 govern the disposal of medical waste. So syringes and intravenous bags no longer show up on beaches with much frequency. And Coast Guard boats now skim coastal waters for other visible debris. But the levels of microscopic organisms that the E.P.A. considers harmful to humans and fish — the real problem — are no less serious than they have ever been.

"When environmentalists see a problem they tend to say, 'Let's have a total solution,'" Mr. Appleton said. "They don't say, 'How much bang can we get for our buck?' They don't say, 'Where is the garbage going to go if it isn't in the ocean?'"

Mr. Appleton certainly considers himself an environmentalist. But he and many others like him say the movement risks its credibility by placing so much emphasis on crowd-pleasing maneuvers like the ban on ocean dumping.

Nina Sankovitch, a senior project lawyer at the Natural Resources Defense Council who worked for the ocean dumping ban, countered: "Environmentalists have a huge agenda. Is dumping sludge worse than burning garbage? Is money spent on recycling better than money spent on clean water? There aren't answers to those questions. So when we have the opportunity to improve the environment we go for it. And the Ocean Dumping Ban Act was a great opportunity."

Ms. Sankovitch says she now focuses much of her attention on the problem of combined sewers. But she said she sees nothing wrong with using the images of 1988 to help ban dumping — even though the two problems were not connected.

"A victory for the environment is a victory for the environment," she said.

But it is not completely clear that a ban on dumping was such an environmental triumph. The negative effects of burying sludge close to the shores have been documented with precision. But the dangers of dumping it in deeper water are less clear.

Studies have shown that sludge deposited 106 miles out does reach the ocean floor and, in the words of Dr. Frederick Grassle, director of the Rutgers Institute of Marine and Coastal Sciences, "it has a minute but measurable impact on the deep-sea ecosystem." However, Dr. Grassle also said that health risks from the dumping appeared to be minimal — primarily because the ocean rapidly diluted the waste below dangerous concentrations.

Some researchers have proposed the nearly lifeless plains at the bottom of the oceans as a relatively inexpensive, and safe, disposal site for sludge. They argue that at the deepest levels of the sea — several hundred miles away from any coastline and under nearly 16,000 feet of water — the sludge will rest undisturbed and harmless.

Short-Sighted Proposal?

However, many environmentalists and some scientists view the research

proposals for deep-sea burial of sludge as short-sighted.

"It will take 10 seconds of logic and $10 million to prove that this too will have adverse effects on the environment," said Dr. Elliott A. Norse, a marine ecologist who is chief scientist for the Center for Marine Conservation.

But John Edmond, professor of chemical oceanography at the Massachusetts Institute of Technology, said: "There are going to be impacts on our society of anything we throw away. That includes ocean dumping. But there is a real crisis in land disposal of our waste, and we have acted to ban even the consideration of ocean dumping.

"Even if we don't use the upper ocean — and perhaps we should not — we should think about the sea floor. But people are so emotional about these issues that they can hardly see or think straight."

[From the New Yorl Times, March 23, 1993]

Animal Tests as Risk Clues: The Best Data May Fall Short

By JOEL BRINKLEY
Special to The New York Times

GAITHERSBURG, Md., March 20 — Dozens of caged rats and mice spend their days here in a laboratory chewing on Purina rodent chow laced with as much boric acid as they can tolerate without risk of death from poisoning.

These rodents and more than 1,000 others are being used to study seven common environmental and household chemicals to see if any cause reproductive problems. The rats and mice are allowed to breed at will. Then scientists here at R.O.W. Sciences, a research laboratory that works under Federal contract, examine several generations of offspring for abnormalities or defects.

This project is just one of roughly 65 rodent studies under way at 15 laboratories across the country at an average cost of about $2 million each. For much of the last two decades, these studies have been the Government's most important diagnostic tool for identifying environmental problems that are health hazards and setting priorities for Federal regulation.

Billions Down the Drain?

But now the animal-studies program is being hobbled by doubts about its worth. So much evidence has accumulated that chemicals frequently have wholly different effects in animals and humans that officials throughout Government and industry often do not act on the studies' findings.

And with that growing skepticism, the rationale behind a large portion of the nation's environmental regulation is thrown into question.

As a result, even Dr. Kenneth Olden, director of the National Institute of Environmental Health Sciences, the branch of the National Institutes of Health that directs the animal studies, asks whether the nation is wasting billions of dollars regulating substances that might pose little risk.

The findings from about 450 animal studies over the last several decades, Dr. Olden said, have led Federal and state governments to write thousands of regulations forcing government and industry to spend tens of billions of dollars a year regulating the use and disposal of several dozen chemicals, or finding alternatives for chemicals that have been restricted or banned.

For instance, it was data from rodent studies that led the Government to ban or restrict the use of two kinds of artificial sweeteners, cyclamates and saccharin, as well as the pesticide DDT and the industrial byproduct dioxin.

In Dr. Olden's view, "That's an awful lot of money to be spending to be regulating substances we might not have to be regulating at all if we had more information."

After spending many billions of dollars to clean up dioxin, the Government is midway through a reassessment because new studies of people exposed to dioxin — once considered one of the most poisonous substances in the world — show it is not nearly as harmful as originally believed.

Similarly, John A. Moore, a former assistant administrator for the Environmental Protection Agency who now heads the private Institute for Evaluating Health Risks, noted that DDT was banned because it was believed to be a carcinogen.

But new data show that it poses "a relatively modest cancer risk," Dr. Moore said, though DDT does present other environmental hazards. And as for some of the other chemicals that have caused cancer in rodents, Dr. Richard A. Griesemer, deputy director of Dr. Olden's institute, offered some additional revisionist ideas.

"Saccharin doesn't have much risk," he said, "and I don't think cyclamates have any risk at all."

Scott Green understands the weaknesses of his research. He is R.O.W.'s laboratory manager, and he did note that the reproductive studies "are already finding some effects." Some rats and mice are producing fewer litters that are smaller than average. "But is that relevant to what's happening out there in the environment?" he asked. "I can't tell you."

What Price Cleanup?

Third article of a series.

Origins

Rodents Are Used In War on Cancer

The Government first began experimenting with rodent studies in the early 1960's, and the progam grew exponentially after the Nixon Administration announced the Government's "war on cancer" in 1971. Even with some known weaknesses, scientists enthusiastically embraced the animal studies as clear indicators of cancer risks.

Though there was no legal requirement to act on the studies' results, a welter of laws did require Government agencies to protect the public from foods, drugs, household products, industrial chemicals and other substances that caused cancer. So Government officials responsible for protecting the public health accepted the data as justification for many new regulations in the 1970's.

Then in the 1980's, new data from the rodent studies helped fuel another wave of modern environmentalism — the push to insure that certain compounds believed to be toxic were not present in air, water or the ground even at minute levels.

With each new piece of environmental legislation — the Superfund law, revisions to the Safe Drinking Water Act and others — Congress required the E.P.A. and other agencies to set safe exposure limits for hundreds of specific pesticides, industrial chemicals and other substances. Those new limits were derived from rodent-study data; thousands of new regulations were written as a result.

By the mid-1980's, however, new research findings began to cast new doubts on the validity of the animal research. Government was no longer so quick to accept the results automatically in every case. But by then, dozens of substances had been ruled safe or dangerous based on the animal studies alone.

By the time Dr. Olden took over as director of the Health Sciences Institute in 1991, the animal studies were increasingly being called into question. Almost immediately, he empaneled a group of the nation's leading experts to study his agency's toxicology-research program to help him decide whether to look for a new approach.

Last summer, the group's report said many of the assumptions driving the rat and mouse research "do not appear to be valid." The experts particularly questioned the practice of feeding rodents the "maximum tolerated dose" of the chemical being tested, the M.T.D., as it is called.

With that technique, used in almost every animal study, scientists feed a test group of mice larger and larger quantities of a substance until they find the level that actually poisons the animals. Then during the actual test, they feed new animals what they have determined is the maximum dose the animal can tolerate without death from poisoning.

The reasoning is that high doses will more reliably produce tumors or other effects in statistically significant numbers. Scientists might have to use thousands of animals to get a meaningful result at doses close to normal human exposure — 85,000 mice for the saccharin study, Dr. Griesemer said.

So using the high-dose reactions, scientists devised scales helping them to speculate on how people might react at lower levels. But Dr. Olden's review committee said it did not believe that this reasoning was valid. The review committee wrote, "Approximately two-thirds of the carcinogens would not be positive, i.e., not considered as carcinogens, if the M.T.D. was not used."

In other words, two-thirds of the substances that proved to be cancerous in the animal tests would present no cancer danger to humans at normal doses.

Dr. Griesemer and others disagreed with that particular finding. They said that probably only one-third, not two-thirds, of the chemicals shown to be carcinogens in animals would likely be benign at lower levels. Still, Dr. Griesemer acknowledged, a possible error rate of even 33 percent is worrisome.

He and others at the institute's headquarters in Research Triangle Park, N.C., agree that animal research, by itself, should no longer be accepted as a reliable means of judging risks for humans.

"The problem is we don't know what the findings really mean," Dr. Robert Maronpot, chief of the institute's experimental-pathology laboratory, said of the animal studies.

As illustration, Dr. Allen J. Wilcox, chief of the institute's epidemiology branch, cited a recent institute study showing that rodents consuming cola beverages "showed an association between the cola beverages and renal failure," or loss of kidney function.

"But the results are murky," he went on. And so the institute is choosing not to draw conclusions until more research is done.

Another study, completed about a year ago, found that rats and mice develop cancer when fed high doses of oxazepam, a direct chemical relative of Valium. Valium is among the nation's most-often prescribed drugs, and the rodents taking the maximum tolerated dose of oxazepam "had a 100 percent incidence of tumors, all over the body — very quick," Dr. Maronpot said.

And so the institute began a rare, crash study, devoting all available resources to see what more could be learned.

Examining frozen DNA sections from the affected animals, "we found this was an M.T.D. result," Dr. Maronpot said. "Oxazepam would not be a problem even for a mouse at normal human dosage levels."

But this kind of research is costly and time-consuming, and the technology has existed for only a few years.

Dr. Maronpot swept his hand toward a long row of blue books stretching more than 10 feet along an upper shelf, reports on all 450 animal studies the Government has conducted over the last 30 years.

"It's an impressive product, not produced by anyone else in the world," he said. Still, Dr. Maronpot acknowledged, neither he nor anyone else at the institute knows how many of the tested substances that produced tumors or other harmful effects in animals — about half the total — might now be shown to be benign at normal levels.

Even more worrisome, perhaps, is the opposite question: How many substances that caused no harm to rodents might be dangerous to humans? One chance finding demonstrated this problem.

"Arsenic is not a carcinogen in animal studies," said Dr. Joseph F. Fraumeni, director of epidemiology and bio-statistics at the National Cancer Institute. But several years ago, he recalled, a study of smelter workers exposed to high levels of arsenic in the air showed a high level of lung cancer.

From that, Dr. Olden's review committee concluded that the Government should no longer rely only on animal studies. They should be simply one part of a program of research also involving studies of population groups found to have been exposed to the substances without knowing of the possible risk, and laboratory analyses showing how the chemicals interact with cells.

That is easy to say, institute officials agree, but difficult and costly to do.

Progress

Studies of Cells At Cutting Edge

Since the review committee's report, more and more attention has been directed toward Dr. Maronpot's little shop, the institute's pathology laboratory. It is here that the crash oxazepam study was carried out. And it is in laboratories like these that the future of toxicology research is believed to lie.

Here, scientists try to figure out how substances interact with human cells, whether they cause mutations that can lead to cancer. And when research like this works, scientists believe they have the most credible findings now achievable.

"That's what we're focusing on now, understanding the responses at the most basic level," Dr. Maronpot said. "We're making progress." But he is at the cutting edge of science, and he acknowledged that "there's still so much we do not know."

As it is, if a substance that produces a carcinogenic effect in mice is referred to Dr. Maronpot's lab, "typically it can take two three, maybe even five, seven, eight years" to carry out one of these studies. So Dr. Maronpot's laboratory can offer a second opinion on fewer than 10 percent of the substances subjected to animal studies.

Nearby, Dr. Wilcox heads the department that offers the second-best hope for validating findings from the animal studies. He and seven other epidemiologists try to find specific groups of people who have been exposed to the substances to see if they have suffered ill effects. The smelter workers exposed to arsenic are an example. But unfortunately, Dr. Wilcox said, similar examples of epidemiological studies are rare.

"The whole area of environmental epidemiology is a frustrating one," he said. The principal problems are that people are generally exposed to low levels of the suspect substances. And even if they suffer unusual health problems, it is hard to know whether the illnesses were caused by the substance or something else — smoking, poor diet, etc.

"Epidemiology is a real crude tool for looking for associations," Dr. Wilcox acknowledged. It is also time-consuming. As a result, his department, like the pathology laboratory, is able to examine only a tiny percentage of the substances subjected to animal studies.

That means the institute and the rest of the Government can seldom offer much more than the animal studies as warnings of a substance's possible danger to humans.

"We're looking for alternative approaches," Dr. Griesemer said. "But right now, that's what we've got."

Quite often, that means no one takes the institute's warnings seriously any longer.

Problems

Frustrations Grow With Knowledge

Almost two years ago, the results came in from rat and mouse studies of 1,2,3-trichloropropane, an industrial solvent used as a paint and varnish remover or a degreasing agent.

Almost every animal exposed to the substance was riddled with tumors "in several organs," said Dr. Richard D. Irwin, the institute toxicologist who wrote the report. "This is the type of chemical that shows the greatest potential for human effect."

"Our understanding is that workers wash themselves in this," Dr. Griesemer said. And since the chemical is absorbed in the skin, he and others said, the finding was particularly troubling.

In Dr. Irwin's view, "It would be real good to get some human data because I'm sure there were people who were exposed to it in the past, maybe even now."

So did the epidemiologists look for people who had been exposed to the substance?

"This isn't one we're looking at," Dr. Wilcox said. But maybe, he added, the National Cancer Institute's epidemiologists did look at it. The cancer institute has what is probably the world's largest cancer epidemiology department — 100 scientists and support staff — and they get the animal-study reports automatically. But they seldom choose to begin a study based on the animal research, and they did not initiate one in this case.

In 1990, when a rodent study suggested that fluoride might be a carcinogen, "we took that one on," said Dr. Fraumeni, head of epidemiology for the cancer institute. "We found nothing, and that was the last time."

As for trichloropropane, he said, "I haven't heard of it."

Dr. Irwin wondered if the Occupational Safety and Health Administration might have done a survey or found a way to check on workers exposed to the chemical.

But Dr. Edward Stein, a health scientist for O.S.H.A., said the agency had done no surveys and had not changed its standards for trichloropropane since January 1989, when it issued a regulation limiting airborne emissions of the substance.

Up to the Manufacturer?

As for telling people of the dangers, Dr. Stein added, "The primary manufacturers of

the product would be responsible."

"I presume when updating training programs at companies that use this, say annually, whoever is doing that would be aware of the new information," Dr. Stein said. "They would make the employees aware of it, but I'm not sure if that is actually being done."

"We always have a battle on the issue of what to do with the animal data," Dr. Stein added. "I'm not trying to downplay it, but I do believe other things ought to have priority."

So back in North Carolina, Dr. Irwin said: "I really haven't heard of anything happening. It's almost as if our work just goes into a black box."

Acknowledging that problem, Dr. Olden said: "I have to say we don't serve the American people very well right now. But that's where we are."

[From the New York Times, March 24, 1993]

How á Rebellion Over Environmental Rules Grew From a Patch of Weeds

By KEITH SCHNEIDER

COLUMBUS, Ohio — This city didn't want to pave paradise for a parking lot. It just wanted to cover a patch of weeds and mud behind the Short Street garage, where the city maintains its fleet of police cruisers and garbage trucks.

But two years ago, city engineers here in Ohio's capital discovered traces of chemicals in the dirt and learned that the Federal hazardous-waste law might require a $2 million cleanup before the first ounce of pavement could be laid. Right then, a forgettable little stretch of urban America became the focus of anger and exasperation so profound that it started a national campaign among cities and states.

After the city issued a report on its problems, all of a sudden Columbus's leaders were joined by hundreds of city officials, state leaders and many private homeowners across the country as they advocate a cause that until now big business has been arguing most forcefully: that many of the nation's environmental regulations bring enormous expense for little real benefit.

Although independent safety specialists said the chemical concentrations were too small to cause any harm, Federal law defined several of the compounds as hazardous and required that they be removed, if detectable in the soil at all.

What the Law Demanded

In effect, the law required the city to take these expensive steps:

¶Dig up 2.4 million pounds of dirt containing no more than a few pounds of toxic chemicals from a patch of ground no larger than a baseball diamond.

¶Ship that dirt 1,500 miles south to Texas to be burned in an incinerator.

¶Install detection equipment to monitor the air for up to 25 years for traces of any contaminants that might remain.

All this, the engineers asked, to expand a parking lot?

They called a meeting at City Hall, and that led to the first major study to identify the cost of complying with Federal environmental regulations. When it was completed, the study showed that environmental costs were about to swamp Columbus in red ink — or generate a taxpayer revolt.

Now nearly 1,000 other cities have asked to see the report. And prompted by the Columbus study, the National League of Cities has made updating the nation's environmental laws — and through that reducing costs — one of its top five political priorities in Washington.

In January, mayors from 114 cities in 49 states opened the campaign by sending President Clinton a letter urging the White House to focus on how environmental policy-making had, in their view, gone awry.

"Not only do we sometimes pay too much to solve environmental problems, we've been known to confront the wrong problems for the wrong reasons with the wrong technology," the mayors said.

During the Bush Administration, William K. Reilly, the Administrator of the Environmental Protection Agency, offered public support for this campaign and even began offering grants to states that wanted to reevaluate their environmental priorities.

With that money, Michigan and Vermont were among the first to appoint panels of citizens and scientists to examine environmental policy. In published reports, both state's panels concluded that the largest sums of money were being spent on the least threatening environmental problems, like exposure to toxic and radioactive wastes. In the view of these state panels, more important environmental issues, like damage to farmland and forests, were being largely ignored.

"We're really just about at the end of the reductions in risk that you can achieve by the conventional approach, which is to crank down on the pollution coming out of the end of the pipe," said Dr. William Cooper, an ecologist at Michigan State University who helped lead his state's study. "Now we're into more subtle issues. How clean do we really want our environment? How much are we really willing to pay for it?"

The Seeds

Benefits Are Vague As Policy Shifts

The seeds of this grass-roots push lay in the Federal Government's shift in focus over the last 15 years from promoting broad environmental goals (purifying the air, cleansing the water) to regulating specific toxic substances: dioxin, asbestos and dozens of other compounds found at trace levels in drinking water, chemical-waste sites and the like.

Controlling the kind of pollution that poured out of automobile tailpipes or factory smokestacks, and stopping waste discharges into rivers and streams, showed clear social benefits. And so public acceptance usually came easily.

But the improvements in health or environmental safety from the more recent efforts have been less obvious. Scientists continue to debate how dangerous dioxin may really be. An industrial byproduct, dioxin was once considered the most toxic substance known to man. Reducing dioxin levels to the Federal standard — less than 13 parts per quintillion in drinking water, the equivalent of a single drop in Lake Michigan — is difficult and terribly expensive, even though no one really knows what, if any, benefits result.

More than 10 years ago, the Federal Government adopted the view that when there is any doubt, it is better to take the prudent approach than do nothing. But a decade later, the economic costs of this policy are painfully clear while the benefits remain largely unmeasurable.

Last year, home owners, farmers, miners and timber industry workers roared into Washington and brought to a standstill Congressional efforts to reauthorize the Endangered Species Act and the Clean Water Act, two of the laws that form the foundation of American environmental policy. President Bush focused on this theme during his re-election campaign, largely siding with these protesters.

This year, city and state leaders

have joined in a campaign to write into environmental statutes a provision requiring the Federal Government to evaluate scientific evidence and the cost to communities before issuing any new environmental directives.

Leaders of the major environmental groups are fighting this idea. They argue that it would set a level of proof so difficult to meet that the Government could not write new regulations until people started dying.

But backers of the provision assert that unless changes are made, public support for environmental protections will crumble as costs continue to rise

The Anger

Counting the Costs In a City Hall

It was precisely this issue of cost that prompted the Columbus engineers to call a meeting in January 1991. One participant, Michael J. Pompili, who was in charge of the Columbus Health Department's environmental-health division, had on his own been quietly studying how much the city would have to pay to comply with a new wave of rules coming out of Washington. These were intended to prevent public exposure to minute levels of chemicals in air and water.

"The guys were talking about spending all that money for nothing at the Short Street garage," he said in an interview. "They were complaining about the $2 million. And I said, the issue isn't $2 million. It's a lot more than that. I told them my guys had identified millions more in costs citywide to meet Federal environmental requirements, and where were we going to get the money to meet those mandates?"

Columbus's Mayor at the time, Dana Buck Rinehart, a Republican, promptly named Mr. Pompili chairman of the city team that published the environmental study in May 1991.

The report said that to meet dozens of Federal environmental requirements, Columbus faced $1.3 billion to $1.6 billion in new expenses from 1991 through the end of the decade, depending on the inflation rate. Virtually all of that money was to come from the Columbus city treasury.

Of the $591 million 1991 city budget, $62 million, or 11 percent, was devoted to environmental protections. That year, the average Columbus household paid $160 for that purpose.

The study said that by the end of the decade, if every Federal requirement were met, Columbus's environmental budget would more than triple, to $218 million, or roughly 27 percent of the city's $810 million budget projected for the year 2000. The cost to a household for environmental protection would be $856 that year — more than the cost of fire or police protection.

"When we came up with these kinds of costs, we also looked for the justification and just couldn't find much there," Mr. Pompili said. "I had to wonder, Am I out of touch? I have worked all my life to protect people from environmental harm. Am I looking at these issues in the wrong way?"

Now, he said, "I no longer ask those questions because I'm convinced that we are doing the right thing."

Mr. Pompili said he wants clean air and water as much as anyone else ("This city will not survive without a clean environment"), but he added: "What bothers me is that the new rules coming out of Washington are taking money from decent programs and making me waste them on less important problems. It kills you as a city official to see this kind of money being spent for nothing."

The Revolt

Battling Radon: Changing Targets

Officials in many other cities feel the same way. Late last year, Hastings, Neb., began its own review of environmental costs and concluded that the single biggest drain on its treasury was the $65 million it would take to build a treatment plant to meet a proposed E.P.A. rule for removing radon from the city's water.

Radon is a radioactive gas formed naturally when radium decays in rocks and soil. It is frequently found at trace levels in water pumped from the ground. Before the E.P.A. proposal, made under authority of the Safe Drinking Water Act, almost no public-health specialist had considered radon in drinking water to be any sort of threat. And for years Hastings had been boasting that its water supply was so clean that it could be pumped from an underground aquifer directly into the homes of 21,000 residents.

Last year, however, the E.P.A. said Hastings did have a problem with its water: Radon levels exceeded the proposed safety limit. But critics of the proposal, including some agency officials, said the E.P.A.'s decision to tackle the radon issue was an inglorious lesson in the dangers of using weak scientific assumptions to write an expensive new regulation, even while many experts found the idea absurd.

Many studies of radon have shown that it is harmful only if inhaled at high levels over a long period. Almost 30 years ago, the Government did confirm that uranium miners in the West contracted lung cancer after years of working in the mines, where they were exposed to some of the highest levels of radon ever recorded. Among those who died, though, it was also true that many were heavy smokers.

Then, during the 1980's, the E.P.A. found significant levels of radon in 10 percent of the homes they surveyed across the country. That led the E.P.A. to call radon the most serious environmental public health threat the nation faced. It was a menace so great, the agency said, that radon was probably causing up to 20,000 cases of lung cancer a year.

That estimate has come under intense criticism from many radiation-health specialists, who have called it unscientific and wildly exaggerated.

Going After the Water

But the E.P.A. ignored the criticism and set an unofficial guideline for the amount of radon it considered safe in homes. The agency has been reluctant to make the limit legally enforceable because of the backlash that some E.P.A. officials feared from homeowners. Hundreds of thousands would have been required to spend thousands of dollars on ventilation equipment to clear radon from basements.

Since the agency was unwilling to regulate the air in private homes, E.P.A. scientists and technical experts chose to defend their assessment that radon was a menace by taking action against the only other source in homes: tap water. So the E.P.A. proposed a legally enforceable limit on radon in water.

Scientists who have looked at the issue said the threat to health from radon in water, if there is one at all, can come only from inhaling radon that evaporates, particularly during showering. In other words, the Government was trying to prevent someone from getting lung cancer from their morning showers.

Independent radiation-health experts said that in virtually every area of the United States, the amount of radon that evaporates from water is only one-thirtieth to one one-hundredth of what is already naturally in the air. These experts said the regulation does nothing to protect health. "It's a silly thing that E.P.A. is proposing because radon in water is an insignificant public health hazard," said Dr. Ralph E. Lapp, a radiation physicist in Alexandria, Va., and author of 22 books on radiation and public health.

If the regulation becomes final, the cost to install filtering equipment in public water systems in the United States would be $10 billion to $20 billion, according to estimates made by several states. The Association of California Water Agencies recently estimated that the cost in California would approach $4 billion.

"How do we explain to our residents the need for a regulation that costs as much as this one will and doesn't provide any public-health benefits?" asked Dr. Adi Pour, the toxicologist for the Nebraska Department of Health. "If this kind of rule-making continues, it's going to hurt public confidence in environmental protection."

The protests prompted Congress last year to pass legislation sponsored by Senator John H. Chafee, Republican of Rhode Island, that prevented the E.P.A. from making the radon rule final until the agency looked at the benefits and costs again. When asked about the rule, Martha G. Prothro, the acting Assistant Administrator for Water at the E.P.A., acknowledged: "We may have gone further than we need to in human health concerns. It's appropriate to go back and look at this proposal."

So for now, Hastings, Neb., has been given a reprieve.

Back in Columbus

As for that parking lot in Columbus. City engineers are still working on the problem. One idea they proposed was to dig up the dirt, turn it over and allow the chemicals to evaporate.

But the state said Federal law forbade that. The engineers then proposed inserting pipes beneath the ground, pumping air to the surface and trapping and filtering chemicals that are released. The state environmental agency is considering that idea. The estimated cost: $250,000 to $500,000.

Regulation and the Price per Life

Two years ago, the Office of Mangement and Budget tried to estimate the cost of certain environmental and safety regulations by dividing the cost of enforcing each rule by the number of lives it appeared to save. The estimate is highly subjective since it is virtually impossible to know how many lives might have been lost without a certain rule. In addition, the analysis did not account for non-fatal injuries. But this cost-benefit analysis did demonstrate the Bush Administration's attitudes toward the laws it was enforcing.

Now, state and local governments are distributing this analysis widely to support their criticism of national environmental policy. Here is a partial list of regulations.

Regulation	Cost Per Premature Death Averted In Millions of Dollars
Ban on unvented space heaters	$ 0.1
Aircraft cabin fire-protection standards	0.1
Auto passive restraint/seat belt standards	0.1
Trihalomethane drinking water standards	0.2
Aircraft floor emergency lighting standard	0.6
Concrete and masonry construction standards	0.6
Ban on flammable children's sleepwear	0.8
Grain dust explosion-prevention standards	2.8
Rear seat auto lap/shoulder belts	3.2
Ethylene debromide drinking-water standard	5.7
Asbestos exposure limit for workers	8.3
Benzene exposure limit for workers	8.9
Standards for electrical equipment in coal mines	9.2
Arsenic emission standards for glass plants	13.5
Ethylene oxide exposure limit for workers	20.5
Hazardous-waste listing for petroleum-refining sludge	27.6
Acrylonitrile exposure limit for workers	51.5
Asbestos exposure limit for workers	74.9
Arsenic exposure limit for workers	106.9
Asbestos ban	110.7
1,2-Dichloropropane limits in drinking water	653.0
Hazardous waste land-disposal ban	4,190.4
Formaldehyde exposure limit for workers	82,201.8
Standard for atrazine/alachlor in drinking water	92,069.7
Hazardous waste listing for wood preserving chemicals	5,700,000.0

Source: Office of Management and Budget, 1991

TAKING STOCK OF ENVIRONMENTAL PROBLEMS

WEDNESDAY, MARCH 31, 1993

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

FEDERAL/STATE RELATIONS IN IMPLEMENTING ENVIRONMENTAL LAWS

The committee met, pursuant to recess, at 9:32 a.m. in room SD-406, Dirksen Senate Office Building, Hon. Max Baucus [chairman of the committee] presiding.

Present: Senators Baucus, Faircloth, Kempthorne, Reid, and Chafee.

OPENING STATEMENT OF HON. MAX BAUCUS, U.S. SENATOR FROM THE STATE OF MONTANA

Senator BAUCUS. The hearing will come to order.

I would like to welcome everyone to the second of the committee's hearings designed to assess key issues affecting our Nation's environmental programs. The results of these hearings will allow the committee to set better priorities as it considers specific legislation in the coming months.

Last week the committee focused on the state of our knowledge about health and ecological effects, and how that information can be used to improve the effectiveness of our environmental statutes. Today's hearing will examine how well the relationship among Federal, State, and local governments is working in implementing those statutes, and it is no understatement that these relationships are a linchpin of our environmental programs.

Without a strong, balanced partnership among the agencies, the goals of our environmental laws remain unfulfilled promises; and, more importantly, the threats to public health and the environment will increase. That is why the subject of today's hearing is so important.

The partnerships were forged during the late 1960's and early 1970's with such landmark laws as the Clean Air Act, the Clean Water Act, and others, and that cooperation worked. The country moved ahead and made significant accomplishments. But during the 1980's, things started to change. We began to see regulatory abuse, selective enforcement, and the loss of trust in those administering the laws at the Federal level. So Congress became more pre-

scriptive, spelling out the requirements of the law in such detail that the administration could not subvert it.

The laws became less flexible, with much less discretion allowed to administrators at all levels. This rigidity created its own problems. Regulations often became a cookie cutter, applying the same solution to different problems, and the organizations became so compartmentalized that the separate offices responsible for air or water or solid waste didn't talk to each other. It is no wonder, then, that cross-media problems became so difficult for agencies to deal with.

Something else happened. Much of the Federal funding that supported those State programs began to wither as the administration cut budgets for domestic programs, including environmental protection. In fact, during the mid-1980's the real buying power of EPA grant support to State programs was barely more than it had been in 1976. This Federal support helped grease the wheels of the partnership, but with budgets now constrained at all levels of government, the wheels are beginning to rub, and in some cases they are in danger of grinding to a near-standstill.

All this is occurring at a time when our laws and institutional structures need to keep pace with the improvements in our understanding of environmental problems. The confluence of these factors is testing the partnership between the EPA and the States as never before. To some, States and local governments, the Federal Government has become a helping hand with no grip, while to others it wields an indiscriminate hammer.

There are several major issues that I would like the witnesses to discuss today.

First is the broader issue of how we can more effectively structure the Federal-State relationship to deal with the ever-changing circumstances presented by new knowledge. Can we devise a scheme which has the flexibility to respond to new developments, and the enforceability to assure that requirements are carried out?

Second, how can we measure the performance of agencies to see where improvements are needed? I'm not talking about the number of permits written or the number of enforcement actions started; rather, how can we relate Federal and State agency performance to the real goal of cleaning up the environment?

On Monday the Wall Street Journal carried an article that described how a chance encounter between an EPA official and an employee of an oil company blossomed into a study which found that, at least in this instance, existing pollution control priorities did not attack the biggest pollution problem. There is a danger in extrapolating the results of one study, but we had best heed the warning if we are to retain the confidence of the people, that our environmental programs are in fact effective.

Third, if the rigidity in organizations—and perhaps in the statutes—creates roadblocks, how can we overcome them without also eliminating an organization's spine?

There are some other issues I would like to explore, including the effect of duplication in EPA and State programs. Can some State programs operate with less supervision from EPA, while some deserve greater attention and assistance?

Some State officials have suggested that it would be more efficient for EPA to play a different role, a role more tailored to the needs of the individual States. Are there too many layers of checks and cross-checks in areas that are not critical to protection of health and the environment?

Recently one witness at a hearing told the committee that in Massachusetts, efforts to cross-train inspectors so that one individual could do the job previously done by two or three persons saved the department about 25 percent. Those savings were then available for other higher priority tasks.

And there is the persistent criticism of State officials about the difficulty and complexity of gaining Federal approval to run the programs. For example, only a handful of States have been authorized the post–1984 RCRA program. Whether it is uncertainty about program requirements, or the cost of running them, there is a double danger in States failing to seek authority. The accountability for decisions is reduced, and EPA's limited resources are stretched even further.

As I mentioned at the outset, the difficulties we see in the Federal-State relationship are not just about money. We will do ourselves and the environment a disservice if we let the debate focus on that alone.

I am particularly pleased that we have with us this morning the EPA Administrator, Carol Browner. This is her first appearance before the committee since her confirmation. She also represents a quality of this Administration that I hope will stand us in good stead. She, like the President, is experienced with implementing Federal programs at the State level. And with a new Administration, I think we have the opportunity to take a fresh look at how to improve the effectiveness of our Federal, State, and local relationships and the effectiveness of our environmental laws.

I would like now to ask a new member of the committee, Senator Faircloth, if he has a statement.

I would inform and remind all members of the committee that Ms. Browner must leave at 10:00 o'clock to attend a Cabinet meeting, so I would ask us to be very brief so that we have an opportunity to ask her questions.

Senator Faircloth. Thank you, Mr. Chairman.

I don't have an opening statement, I just want to thank Ms. Browner for coming, and I want to tell you that we are very much aware of your past administration with the Florida EPA. You are sensitive to the many problems that small communities are having, and I am sure you will be sensitive to, and can empathize, with them. I look forward to working with you on that. Thank you.

Senator Baucus. Ms. Browner, please come to the witness table. Your full statement will be in the record. I strongly encourage you to summarize it as briefly as you can so as to give us the opportunity to ask questions of you.

STATEMENT OF HON. CAROL M. BROWNER, ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY

Ms. Browner. Thank you, Mr. Chairman and members of the committee.

I am pleased to be here today to discuss EPA's relationship with State, tribal, and local governments. I think as all of you recognize, it is these relationships that will ultimately make or break national environmental issues.

This is an issue of particular interest to me, obviously, because of my past experience in a State environmental agency. I have a real affinity for State environmental agencies and what they bring to the table. In Florida, we launched a fairly intensive program to delegate a number of our powers to regional, county, and city organizations because we felt they brought to the table a real understanding of the issues at hand and a set of resources to do the job that the public demanded.

I think that one of the most important pieces of this Administration will be to forge stronger relationships with State and local government and to build on what has already been done. I feel very strongly that we cannot reach national environmental objectives until we acknowledge the value of and support the building of strong State and local capacity to manage environmental programs.

We are presently in a process of reexamining the approaches and roles of the past. State and local governments are questioning whether the Federal Government can determine the most appropriate environmental priorities for their communities, and whether the Federal Government understands and recognizes unique State and local circumstances. We at EPA are also examining the issue of State and local capacity, how we can best utilize capacity in States and communities that have mature programs, and how we can build capacity in those States and local governments that don't yet have enough. How can we give more responsibility to State and local governments and still maintain the nationwide standards of environmental protection that we all desire?

I welcome this examination of Federal, State, tribal, and local roles in environmental protection. I consider it a healthy sign that America's environmental protection is maturing beyond Federal Government implementation of valuable but narrowly focused regulatory programs, toward a new working relationship where environmental protection is a fundamental concern at all levels of government in the United States.

Mr. Chairman, in my opening statement I had for the record addressed a number of the questions that you have specifically raised. Because of the change in the schedule I thought it might be helpful if I just let those stand, and then take questions from you and the other members of the committee. I apologize for the change in the schedule. We were only just made aware of the fact that this Cabinet meeting would be going forward this morning.

So with that, I would ask that my statement be submitted for the record, and leave the remainder of the time for questions.

Senator BAUCUS. Thank you very much, Ms. Browner.

I guess a fundamental question that the State administrators have is, how can we change things around so that EPA in fact does delegate a lot more to States that are running good programs, whether it's in RCRA or Clean Air or Clean Water? The charge is that there is a lot of waste here. There are some States that have good programs. First of all, EPA takes a long time in delegating

the programs. Second, portions of programs are not delegated, and it takes a long time to write these regulations. Then when it is delegated, there is much too much second-guessing; and when there is second-guessing it is in the wrong areas. It's what they call "bean counting," the number of permits issued, the number of enforcement actions taken. There is virtually no relationship to the environment or public health. It's a mess. What do you say to that? And what are you doing to straighten it out?

Ms. BROWNER. Mr. Chairman, I think you raised some very valid questions. The whole relationship between EPA and individual State programs is a complex one. There are instances where I absolutely agree that we move too slowly in terms of the delegation. Once the delegation has been achieved, the oversight is of a bean-counting nature as opposed to a qualitative endeavor or measurement—an analysis of whether the environment is cleaner. Have the overall goals of the program been met?

Part of that, I think, is inevitable when you start down the path of delegation. Early on I think there is a great deal of responsibility on the part of the delegating entity to make sure that the goals are actually being met. The question is, how do you move into the next generation, which is to say, "OK, we respect that; the States have that ability, and we're going to let them do the program, and then we'll just make sure that it is being done in a meaningful way."

Senator BAUCUS. Well, if that's the question, what's the answer?

Ms. BROWNER. Well, it's a change in how we think about our relationship with the State agencies. We at EPA are going to have to think a little bit differently about the State agencies. We're going to have to recognize the strengths that they bring to the table, and we're going to have to allow them to do the job the way they see fit.

I would just say that the other piece of this is that there are places where—and we look forward to working with this committee during reauthorization—where we would like to see greater flexibility in some of the statutes under which we delegate, to make sure that we're not put in an awkward position of always being responsible for making sure on a permit-by-permit basis that in fact what Congress intended is being done.

So we would like to bring the States to the table in the reauthorization efforts this year and in the coming years to make sure that we build in that sort of flexibility, so that we can delegate in a way that recognizes the strength of the States.

Senator BAUCUS. I appreciate that. But where can EPA be more flexible? How much of that can you administer on your own? And in what areas do you need statutory changes and what changes do you recommend so that you will have more flexibility?

Ms. BROWNER. Well, in terms of the individual laws, we would be more than happy to provide you with an analysis of where we feel greater flexibility would be helpful.

I do think that we can also change how we relate to the States. It's not all going to take statutory changes. Part of it is just recognizing within EPA that we need to behave in a different way.

Senator BAUCUS. Do you have any preliminary thoughts, though, as to where you can be more flexible—that's one category—and

second, do you have any preliminary thoughts on what requests you might make of the Congress to change statutes so that you can be more flexible?

Ms. BROWNER. Actual areas? Well, I think one of the issues that has come up is in the whole Superfund area in terms of the role of States and how they might play a different role. That would be one we would like to discuss with the committee during that reauthorization debate.

Senator BAUCUS. Well, frankly, I would like you to dig into this and send to this committee your suggestions as to where you would like statutory authority so that you could be more flexible to help the States.

I guess the fundamental question is one of trust. How do you establish trust? What can you do, and what can we do to help you establish greater trust between EPA and the States?

Ms. BROWNER. I think two things——

Senator BAUCUS. To a large degree, I understand EPA's position. You delegate a program, and you want to make sure it's done right. Now, you can hope it's done right, or you can oversee.

Ms. BROWNER. But we're the ones who get called up here.

Senator BAUCUS. Well, I don't know if that's enough.

How do you begin to establish the trust so that you know you don't have to devote a lot of resources to that State because you can trust that State to do a good job? How do you work on developing that trust?

Ms. BROWNER. Well, we have several processes going on right now in terms of dialogs taking place between EPA and local governments, between State and tribal governments. We need to increase those dialogs. And, quite frankly, we probably need to swallow hard. I know when I looked at delegating my powers in Florida to regional governments, it was just a question of sort of saying, "OK, we're going to do it, and we're going to trust them." That's a hard thing. It's not within our nature, but we have to do it.

I think there is a growing recognition within the agency at all levels that if we are going to accomplish our mission, it will only be through the cooperation of State, tribal, and local governments, that they bring such a large number of resources to the table to help us do our job, and that we have to maximize the use of those resources so that we can be moving on to the next challenge.

Senator BAUCUS. You have been in EPA now for a couple of months. How would you grade the Federal-State relationship? Would you give it an A or an F or some other grade? What grade would you give?

Ms. BROWNER. Well, I think I have an interesting perspective, having been a State agency administrator. Tom Jorling and I were just talking about that relationship and about how each of us felt it could have been a lot better from the State perspective. Now that I have been at EPA for a couple of months, as you say, I recognize that we at EPA have a tremendous responsibility to improve that relationship and that we have to reach out to the States in a way that we never have before.

Senator BAUCUS. What grade?

[Laughter.]

Ms. BROWNER. B minus.

Senator BAUCUS. B minus. You give it a B-minus?
Ms. BROWNER. Yes.
Senator BAUCUS. OK.
With that I will turn to Senator Faircloth.
Senator FAIRCLOTH. Mr. Chairman, thank you.
Ms. Browner, we have roughly some 3,000 small communities in North Carolina; 75 percent of them serve populations under 3,000 people. I think all of them have called me complaining about the high cost of testing for contaminants in their water, and how often they have to do it.
Have you had an opportunity to see what could be done to relieve them? Is it practical? Can't they do less testing and still have safe water?
Ms. BROWNER. A couple of things. First of all, there is some flexibility within the law, and obviously we need to use that flexibility to the greatest extent. We are evaluating our use of the flexibility to make sure that we are actually doing that, to meet the needs of these small systems.
Second, the President in his long-term investment package has called for the creation of a revolving fund of approximately $599 million to go toward small and other communities to help bring them into compliance with the Safe Drinking Water Act. This Administration recognizes that burdens have been placed on communities that do not have the resources to meet those burdens, so we want to assist those communities in coming into compliance. That is why the President has called for the creation of such a fund.
Senator FAIRCLOTH. They complain that they are testing for extremely small amounts of chemicals, almost infinitesimal. Is it vital that we test for that? Are we doing it just because we have instruments that will test for that?
Ms. BROWNER. Well, the agency was placed under requirements by the Congress to add the number of parameters tested for, and there is a schedule under which we are adopting those parameters.
I think there is growing recognition that some of those parameters may not occur in certain parts of the country, and it may not make ultimate sense to require everything in every place. That's something that we admit we need to look at, and then obviously we would need to come back to the Congress.
Senator FAIRCLOTH. Thank you.
Senator BAUCUS. Senator Smith?
Senator SMITH. Thank you, Mr. Chairman. I will be very brief.
In reading your statement, Ms. Browner, I have to say I'm very encouraged by your comments regarding the Federal-State relationship. You say:

> I feel strongly that we cannot reach national environmental objectives until we acknowledge the value of and the support-building of strong State and local capacity to manage environmental programs.

Let me just ask you a couple of specific questions on one of those programs; Superfund.
Some of the environmental programs at the EPA allow States to have responsibility, and in some cases even primary responsibility, to implement and enforce. That's not the case in Superfund. Would you support a greater role for the States in the Superfund cleanup process than they now have?

Ms. BROWNER. Senator Smith, I do think that during reauthorization of Superfund, this is an issue we need to look at very, very carefully. There are an increasing number of States who have the capacity, who have the resources, to probably assume a greater responsibility, and we need to create the flexibility to allow that to happen, where appropriate.

I met with officials of one city yesterday who clearly have a great interest in playing a bigger role, and I think that's something we have to take seriously.

We try to work very, very closely with the States and local governments in the program right now, but you are quite right, that in terms of actual opportunities for delegation, that is something that is not available to us in the same way as it is in other statutes.

Senator SMITH. Specifically on remedy selection, would you support any kind of a formal resolution program so that the States might have more input into settling a dispute between EPA and the States?

Ms. BROWNER. Well, right now we do work in close coordination with the States in remedy selection. We will obviously continue to do that. Whether that is something that should be delegated to the States, I think we need to evaluate that carefully. I think the States absolutely must play a very strong role in the Superfund program if we are to achieve the goals that have been set for the program.

Senator SMITH. I find that very welcome and refreshing and I appreciate it very much. I look forward to working with you on that.

Mr. Chairman, I know that Ms. Browner has to go, and that there are other Senators with questions, so I will yield back.

Senator BAUCUS. Thank you very much, Senator.

Senator Kempthorne?

Senator KEMPTHORNE. Thank you, Mr. Chairman.

Ms. Browner, good morning.

One of my chief concerns as a former mayor is with all these Federal mandates, their impacts on local communities and counties. There was a report that was published, "Paying for Federal Environmental Mandates: Looming Crisis for Cities and Counties," which Mayor Tom Fink of Anchorage, Alaska has produced.

Mr. Chairman, I would ask that this be made a part of these proceedings.

Senator BAUCUS. Without objection. (See p. 190.)

Senator KEMPTHORNE. Ms. Browner, I found your written and oral remarks to be very encouraging. After several decades of aggressive efforts by Congress and the Executive Branch to respond to environmental concerns, efforts which have produced remarkable achievements were overdue in establishing the kinds of working relationships that I think are necessary with State and local governments, that you are now advancing.

You have stated, "We should all be working on what good science and State and local officials on the front lines say makes a difference, good science and good rapport." I couldn't agree with you more, and I appreciate that quote.

There is, however, considerable disagreement over what represents good science. When science runs counter to desired results,

some advocates recommend recourse to so-called "higher values." How do you guard against politicized science? And what changes would you recommend to how we develop a new science so that it becomes a tool for consensus and not a means to divide and entrench us in our positions?

Ms. BROWNER. Well, science is one of the most important tools we have available to us in the work that we do. I think that we need to recognize that science provides us with an awful lot of very helpful information. There may be instances, particularly in the policy arena, where the policymakers may decide to do more than, perhaps, the science suggests at this point in time, and that may be appropriate. That is a policy decision and we need to recognize that, that science cannot always give us the policy answers. That's why we have policymakers.

I think that in terms of regulatory programs and in terms of the permitting, we need to look to science to make sure that we can answer people's questions and concerns, that we have the best information available to us to give people the assurances they need that such-and-such a facility or such-and-such an activity will perform in compliance with the standards that have been set.

So within an agency like EPA there are really two roles for science. One is to help shape the policy, and the other is to evaluate specific decisions that we make as a regulatory agency. Those are two different uses of science, and I think it's important that we recognize that distinction.

Senator KEMPTHORNE. Under current law, many important but minor crop pesticides are due for reregistration.

Ms. BROWNER. Yes.

Senator KEMPTHORNE. For many of these pesticides the process is so cumbersome and costly that companies are not going to find it cost-effective to invest in attempting recertification. In the end, the farmers who depend on those pesticides will lose, as will the consumers.

Have you taken, or are you going to take, any steps to streamline the process for these minor pesticides?

Ms. BROWNER. Senator, we recognize that the reregistration program can be fairly lengthy and, as I think you said, cumbersome. We are looking at that program to see how we can expedite the process. We do recognize the concerns that you raise. I think these are concerns that have been raised previously, and we need to take a look at them.

Senator KEMPTHORNE. Mr. Chairman, in light of the time, I will yield back.

Senator BAUCUS. I appreciate that.

I don't know if you know it, Senator, but Ms. Browner has to leave. She is supposed to leave at 10:00, to give her a chance to get to the Cabinet meeting.

Senator REID. I think she should leave.

[Laughter.]

Senator BAUCUS. Before she does leave, do you have any questions?

OPENING STATEMENT OF HON. HARRY REID, U.S. SENATOR FROM THE STATE OF NEVADA

Senator REID. I have a statement. I will make it part of the record.

[Senator Reid's statement follows:]

OPENING STATEMENT OF HON. HARRY REID, U.S. SENATOR FROM THE STATE OF NEVADA

Mr. Chairman, I would like to thank you for once again holding a hearing on a matter that is of vital interest to the work that this Committee must take up, to my constituents in Nevada, and I suspect, of equal importance in every other state in this country.

In recent trips back to Nevada, I am constantly faced with a barrage of comments and questions about how communities and small towns are going to comply with the Safe Water Drinking Act, or how developers and economic interests can reconcile their future plans for growth with the "habitat conservation plan" that has been signed off on in the city of Las Vegas, in Clark County, Nevada, and additional requirements to protect the desert tortoise, a "threatened species."

We have small communities with very little bonding capacity being ask to install multi-million dollar water systems to clean up their drinking water, in some cases a $100 million dollars or more. I've received a steady stream of mail from retirees, older people on fixed income, telling me that they have been informed that their water bills will soon be increased by 300 percent to pay for these improvements.

And I was recently visited by a chemical manufacturer from northern Nevada that claimed his company was being forced to comply with two sets of regulations on chemicals that went into the production of his products. One set of regulations established by the state legislature, and another regime of regulations established by EPA at the Federal level.

These are instances of problems that I have been hearing about from Nevadans, but I strongly suspect that the majority, if not all, of my colleagues are hearing the same thing from their constituents.

I believe it is incumbent on this Committee to take a hard look at the way we have done business in the past, and proceed with a careful view to the future of states' interests where these major environmental issues and the mandates that accompany them are concerned.

Mr. Chairman, the issue is not whether we want safe drinking water, or if it is important to preserve species and the ecosystems in which they live, or to clean up the superfund and other toxic sites that exist around the nation, or the quality of the air that we as Americans breath. We know that much of this work must be done. But the dilemma we are faced with is how to accomplish these noble goals in a way that best serves both the Federal and states' interests

I look forward to asking the new Administrator at EPA, Ms. Carol Browner, how Congress can better approach the issue of risk assessment in passing on new laws and regulations to the states. And I look forward to hearing from some of the witnesses from different states on what they feel Congress can do to allow them enough flexibility to achieve compliance, and where we may be overextending ourselves, both in resources and regulations.

Again, I thank the Chairman and look forward to the testimony of the witnesses.

Senator REID. I am always glad to see you. You're doing a great job.

Ms. BROWNER. Thank you.

Senator BAUCUS. Ms. Browner, we thank you for taking the time to come up here and spend half an hour with us. We urge you, at the Cabinet meeting, to stand up for the environment.

We very strongly urge you, when we reauthorize the various statutes this year, whether it's the Clean Water Act, portions of RCRA, or Superfund, that you give a lot of thought to subjects that we've addressed so far this year in this committee, namely, environmental technologies and how we can be much more creative in utilizing environmental technologies as we reauthorize our statutes.

Second, how we can do a better job of getting the right information to make the connection between the problem—that is, human health and the environment—and the statutes we authorize and the regulations that you promulgate, as Administrator?

And third, the subject of this hearing, to think very deeply about how we can better utilize our resources so that there is less duplication, particularly in the budget context where we are trying to reduce the budget deficit and cut spending wherever we possibly can. It is incumbent upon all of us, those of us in the Congress and certainly those in the administration, to go the extra mile to address that.

Ms. BROWNER. Thank you, Mr. Chairman.

If I might say very briefly in closing, this is an issue of great significance to us. I really applaud you and the committee for taking the time so early in this Congress to look into this issue. I think that forging stronger relationships with the States, recognizing the role that the States can play, only serves us in the mission that we all share, which is to protect the environment and protect the health and safety of all Americans.

So we really appreciate this opportunity to begin this dialog on these very important issues and look forward, as we deal with the individual reauthorizations, to working with the States, to bring to this committee recommendations on how to structure those reauthorizations so that we recognize the resources of the States.

Senator BAUCUS. I think we can go even further. I sense a very strong—to use an overworked word—"partnership" emerging this year, 1993, in lots of areas, between the President and the Congress. People do want gridlock to end. I think we all hear that and we know that, and as a consequence, we are doing better at working together. I know that the States are finding innovative ways in their regulatory apparatus to deal with this, and so have you have. In your experience as Florida's environmental administrator you have worked with the Everglades and with wetlands and with Disney, for example, and I just urge us to build on that momentum and take advantage of that trend that is now occurring.

Ms. BROWNER. Thank you. And I apologize for the change in the schedule, but when the President calls—thank you very much.

Senator BAUCUS. You bet. There will be plenty of other opportunities. Thank you.

Ms. BROWNER. Thank you.

Senator BAUCUS. I would like to now call our panel, which includes the Honorable Tom Udall, Attorney General of the State of New Mexico; the Honorable Tom Jorling, Commissioner of Environmental Conservation, State of New York; Mr. Whitney Tilt, Director of Conservation Programs for the National Fish and Wildlife Foundation; and Mr. David Jordan, Administrator of the Indianapolis Air Pollution Control Division, on behalf of the Association of Local Air Pollution Control Officers.

All right, Mr. Udall, why don't you begin?

Your statements will be in the record. I encourage you to summarize your statements in five minutes.

STATEMENT OF HON. TOM UDALL, ATTORNEY GENERAL, STATE OF NEW MEXICO

Mr. UDALL. Thank you very much, Mr. Chairman and members of the committee.

I would note for the Chairman that the very able attorney general, Joe Mazurek from the great State of Montana, is here in the audience with us.

My name is Tom Udall. I am the Attorney General of the State of New Mexico. I am here in my capacity as the vice chair of the Environment and Energy Committee of the National Association of Attorneys General, and also as the chair of the Environment Legislative Subcommittee.

We have 33 Attorneys General who are involved in the NAAG Environment and Energy Committee, which shows the importance and the interest that Attorneys General have in the subject of the environment and its protection.

As you know, Mr. Chairman, State Attorneys General have taken a lead in environmental enforcement. They are involved in a number of different ways, both civil and criminal, on the environmental front. I would like to talk about that today, and ways that we could improve the relationship between the States, the Federal Government, and the tribal groups.

First of all, let me tell you that we had our spring meeting, all 56 Attorneys General, here in Washington over the last three days. We met with Administrator Browner and we met with Attorney General Janet Reno and Vice President Gore at the White House, and I can tell you that there is a big change in Washington in terms of the State-Federal partnership. I have no doubt that these former Florida State officials, Janet Reno, a State prosecutor, and Carol Browner, who directed an environmental department, both want to reverse the problems that have occurred in the past between the States and the Federal Government. All of our group agreed with that perception.

Why is it important to have a good State-Federal partnership? Well, I would suggest to you—and I believe the Chairman hit on it a bit earlier—that it is because we have very limited resources and we need to maximize our resources in terms of enforcement. I applaud your efforts and those of your committee here in reaching out and taking stock of what has happened over the last 20 years and trying to find ways to make the environmental laws work better; trying to find out where there have been failures.

As an association, we commit to work with you very closely and to make suggestions in the reauthorization process of these major environmental laws that are coming up in the next couple of years.

Let me make three quick points.

First of all, we need better coordination between the Environmental Protection Agency and the States. I think that we have made headway already in Washington by meeting with Carol Browner. She is unable to hear my comments because she has left, but she has already committed to a high-level joint strategy planning conference where Environmental Protection Agency officials, officials from the National Association of Attorneys General, and others that are involved in enforcement efforts will look at the big

picture. Hopefully, through that we will be able to come back to you in a partnership fashion and tell you the changes that need to be made in many of the environmental statutes.

Number two, and this is particularly important to the Congress, when the Environmental Protection Agency promulgates regulations, the States must be considered a special party. States are coregulators when it comes to Federal environmental protection regulations. We end up being the ones who have to live with them. We have to enforce them. We believe that at a very early stage, the States should be brought into the process, well before regulations are proposed.

You did that in the Federal Facilities Compliance Act. You actually mandated that there be an earlier phase requiring State input prior to the promulgation of regulations. I applaud you and the committee for having the foresight in that area.

My final point has to do with direct funding and training.

If you want to see good enforcement done, it's my sense that you should direct the resources—and I know you're not the Appropriations Committee—direct the resources to the people who are doing the enforcement, which in many cases are the State Attorneys General who are bringing the cases. Many times we get into turf battles with the State environmental agency when we can't come to agreement on sharing Federal funds appropriated to the State agency. I think direct funding to State Attorneys General for enforcement would solve that problem.

What I would also like to see—and I'm sorry that Senator Lieberman can't be with us—is more funding for the National Enforcement Training Institute, which was put into the Pollution Prosecution Act of 1990. Until we get really good training for our State and Federal environmental enforcement personnel, we are not going to have meaningful enforcement.

So with that, let me tell you that our association very much wants to put aside the Federal-State turf battles that have gone on in the past. There is plenty of credit to go around. We want to work with your committee and the members of the United States Senate and the members of the Congress to see that this partnership grows and prospers in the future.

Thank you very much.

Senator BAUCUS. Thank you very much, Mr. Udall.

Mr. Jorling?

STATEMENT OF HON. THOMAS C. JORLING, COMMISSIONER, DEPARTMENT OF ENVIRONMENTAL CONSERVATION, STATE OF NEW YORK

Mr. JORLING. Thank you very much, Mr. Chairman. I will submit my prepared statement for the record and will speak about several things in the time allotted.

I think it should be noted at the outset that the quality of the Federal-State relationship depends upon the quality of the respective organizations. I think it is also important to note that the sky is not falling. The Federal Government and the State governments have evolved over these 25 years of the environmental era so that they now have very mature, very professional, and very competent

staffs. In fact, the maturation of the Federal and State governments is one reason this hearing is timely. Many of the statutes and many of the early patterns of Federal-State relationships were established on the premise that States were junior partners, they weren't fully competent, and they weren't fully staffed or organized to deal with these ambitious programs. That has changed. Now we have a very mature relationship. The fact that the United States has produced more environmental protection than any Nation in the world is a tribute to the success of this relationship.

But that doesn't mean we shouldn't look at the problems and the frictions, or try to identify areas needing improvement. Let me just touch on a few of those.

Delegation lies at the heart of the Federal-State relationship. The delegation process operates differently depending upon the program. I think what I would argue on this point is that Congress focus from the vantage point of the regulated community. Go out to a physical plant site and examine how the Federal and State agencies affect that plant site. You will find that the impacts are very, very complicated. What this means is that the delegation process has been uneven. We are at a stage now where the Federal Government must not, in its delegation decisions, hold the States up to higher standards than it holds itself. By not doing so, it will find that it will delegate entire programs instead of separate program elements under RCRA, the Clean Water Act, and the Clean Air Act. Delegations of the entire program should be the goal.

Right now we have situations where plant managers do not know to which agency, the Federal agency or the State agency, they are accountable in a particular element of compliance. That's not an appropriate situation. Delegation of the entire program has to be our goal. This will lead to more coherent implementation of these broad statutes.

Also, the statutes themselves should be implemented in a coherent way. By this I mean that there is a body of law covering various environmental programs that is simply staggering in terms of its different timetables, different mandates, and different processes. Without further change, we may be capable if integrating and implementing these disparate laws in a coherent way, but it's going to require the Federal Government and the State governments working very closely together.

Mr. Chairman, I am submitting for the record a very minor amendment that I suggest will give us the flexibility to integrate the procedural and substantive requirements of our individual environmental programs into a comprehensive and coherent application, permitting, regulatory, and enforcement program.

[The amendment referred to by Mr. Jorling follows:]

INTEGRATED FACILITY MANAGEMENT PILOT DEMONSTRATION PROGRAM

Section ——

(a) The Administrator, with a state or states, is authorized to conduct one or more pilot integrated facility management programs.

(b) Notwithstanding any other provision of law, a state or states which have received delegation to implement programs under one or more of the authorizations listed in paragraph (d) of this section may through rule and regulation integrate the procedural and substantive requirements of such programs into an integrated application, administrative practice, permit, and inspection and enforcement program.

(c) For purposes of making a transition to the integrated facility management program implementing one or more of the authorities described in paragraph (d) the state, with EPA concurrence, may adjust application requirements, administrative practice requirements, and permit terms and conditions in a manner necessary to reconcile differences among the various authorities except (i) that no such adjustment may relax any substantive requirement of the authorities listed under paragraph (c), and (ii) an integrated permit term shall not exceed five years.

(d) The programs to which the authority conferred in this section applies are those authorized pursuant to the:

(i) Toxic Substance Control Act (15 U.S.C. 2601 et seq.);

(ii) Clean Air Act (42 U.S.C. 7401 et seq.);

(iii) Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.);

(iv) Safe Drinking Water Act (42 U.S.C. 330f et seq.); and the

(v) Solid Waste Disposal Act (42 U.S.C. 6901 et seq.)

(e) Notwithstanding any other provision of law, the Administrator and the state or states are authorized to spend up to 50 percent of their program grants established under authority of the laws listed in paragraph (d) for the development and implementation of integrated facility management and permitting programs as established in the regulation under paragraph (a).

EXPLANATION OF AMENDMENT

This amendment authorizes the Administrator to establish one or more pilot programs to demonstrate integrated facility management through permitting and enforcement and it clarifies the authority of states to adopt the integrated facility management approach in issuing permits and undertaking enforcement in any of the following federal programs for which it has received delegation: Toxic Substances Control Act; Clean Air Act; Clean Water Act; Safe Drinking Water Act; and the Solid Waste Disposal Act.

In integrated facility management, environmental regulators review facilities in a holistic manner, issuing a single permit or group of coordinated permits to cover all regulated activity at the same time, and scheduling inspections and other enforcement activities that encompass the entire facility and not selective portions of the industrial process. Integrated facility management allows facility-wide pollution prevention programs to be planned and implemented more effectively; it is consistent with the current thrust of environmental regulation to ensure that reductions in discharges to one media are not accomplished at the expense of increased pollution to other media. Integrated facility management also allows more effective and less costly use of scarce government resources, and it is of benefit to the regulated community since it enables them to acquire all necessary permit through one application procedure rather than being required to submit separate applications for each required permit under a variety of procedures and timeframes.

This amendment allows EPA to operate a program demonstrating the integrated facility management concept, and it clarifies the states' authority to adopt the concept for any facilities regulated under federal programs which have been delegated to the state. Finally, the language allows states to use up to 50% of their program funding for integrated facility management programs to ensure that controls applied to state grants under individual programs to not inadvertently stymie implementation of integrated facility management systems.

Mr. JORLING. Another focus of the delegation matter should be the timeliness of governmental actions. If the Federal Government and the State governments have divided responsibilities in issuing a permit to a new or existing facility, then those permit processes can operate at very distinct and different timetables leading to a failure to act in a timely manner from the perspective of the regulated community. If we focus on timeliness, we can also improve the general relationship between the Federal Government and the State governments.

There are also statutes which do not have delegation measures in them to the same extent as the mature statutes such as Clean Air, Clean Water, and RCRA. Superfund was mentioned earlier. As you will note in my prepared remarks, as part of the CERCLA reau-

thorization, we strongly support delegation of the Federal Superfund program to States that are capable of implementing it.

The funding relationship between the Federal Government and the State governments must be improved. EPA must not micromanage the funding decisions of the States. There must be trust and respect among these levels of government.

Some management initiatives could also be taken. These aren't very sexy, but if EPA would assign people to the States through IPAs, interpersonnel trades of people, in effect, then we could do with people what we are not able to do with money at the present time with short resources.

Given time is running short, there are a couple of areas that I would specifically mention that need attention.

Three Federal statutes were enacted recently that provide great promise, but they also have a great deal of complexity: The National Energy Act; ISTEA; and the Clean Air Act. It is going to take very wise implementation for the promise of those three statutes to be carried down to the States, and for the common objectives that are established for all three of those statutes to be realized.

Another area is public finance. The Administrator today testified about the President's initiative on the State revolving funds. I strongly support retention of revolving loan funds as the mainstay of public financing of environmental infrastructure. I am submitting for the record today a paper which describes the benefits and differences of grants as compared to loans. (See p. 177.)

Another area that troubles us at the State level is the current negotiations and activities regarding NAFTA. There are some elements of NAFTA that could allow preemption of certain State laws in the United States that we feel very strongly about. We need to have NAFTA evaluated with respect to those State preemption issues. I am also submitting a paper for the record on this subject. (See p. 177.)

Mr. Chairman, I would also like to supply to the record the New York State position on the broad array of environmental legislation that is pending before Congress in this term so that you have a sense of the approaches that we would recommend to the committee. [The document referred to has been retained in Committee files.]

Mr. JORLING. That would complete my statement. I would be happy to answer questions.

Senator BAUCUS. That's an exhaustive list. Thank you very much.

Mr. Tilt?

STATEMENT OF WHITNEY C. TILT, DIRECTOR OF CONSERVATION PROGRAMS, NATIONAL FISH AND WILDLIFE FOUNDATION

Mr. TILT. Thank you.

Today I would like to focus my comments on cooperative partnerships that embrace the Federal, State, and private continuum for natural resources more specifically than some of the environmental statutes. While by no means inclusive, I would like to examine the need for education, investment, partnerships, and renewed effort.

We hear a lot about education. After all that we seem to have done on it, I would submit to this committee that if we tested the environmental IQ of our children, it would make our geography scores or math scores look very good. We cannot really expect laws passed by this committee or anywhere else to be effective if, in fact, our youth, and even our adults, have no idea why they are being enacted.

Today, Mr. Chairman, our educational efforts are not unlike the prairie potholes of the eastern part of your State. They are isolated, small, fragmented, and very susceptible to outside interference.

What we need is to get groups like the EPA, the Interior agencies, and Agriculture to start talking to each other. There is a lot of duplication there, but they should make a commitment with the Department of Education to make the understanding of our environment, the need for clean air and clean water, and how we're going about it, part of this effort in our schools. We cannot expect the next generation of voters to gain citizenship if we don't take education and run with it more effectively than we have.

Turning to investment. Well known to this committee, we have been working at restoring endangered species, restoring our wetlands, and we know the difficulty of sustaining investment over the long term. Already highly successful programs, like the North American Waterfowl Management Plan, are struggling for continued investment even though they have been highly successful in achieving their goals to date.

We obviously have to recognize that the Government is no longer going to be in the process of buying all those lands, and yet 75 percent of our woodlands and 75 percent of our wetlands remain on private lands. We now have to take that charter between the States and the Federal Government and take it to the private landowners, to vest them into the solutions.

We will hear a lot about the upcoming reauthorization of the Endangered Species Act and all how private landowners would much rather kick those endangered species off their lands, before they are determined and documented, rather than work with the States and the Federal Government. We've seen how we can do it in wetlands; now we need to take that proactive choice to the private landowners and make them the stewards, alongside the Federal agencies and the States.

The Fish & Wildlife Foundation, established by Congress in 1984, is really the living embodiment of the concept of partnerships, working with the Federal Government and involving the States. Since 1986 we've done 723 projects, taking $26 million appropriated by Congress, adding in another $59 million from the States and nonFederal partners, to put $85 million on the ground. That's a return of $3 for every single Federal dollar invested. More important is that the projects build a constituency on the ground by involving the State agencies and making them part of it; we begin to bring them to the table.

Another nice part is the use of the challenge grant—and I would submit that this is not a silver bullet for everything that is facing this committee—a challenge grant can bring in these nontraditional partners who remain at the table with the States and the private groups and the Federal agencies long after someone like the

Foundation is gone. So the private groups work with the States and the Federal agencies, find out that it's not so bad, and they are able to continue the relationship.

In concluding, there are obviously a number of things that we need to try to do a little bit better.

First of all, the Federal agencies to date do not understand partnerships. Whether it's the newly formed National Environmental Training and Education Foundation or others, too often the Federal Government works at making it difficult to enter into a partnership. To be effective, a partnership must have everybody at that table bringing some aspect of time, talent, or treasury. This is the grant agreement we are obligated, because of our trust responsibilities, to give our grantees.

Now, if you are a small group like the Montana Land Reliance, and this lands on your desk, it's a sobering day. I would submit that there are ways that we can maintain our accountability with our grantees to assure the wise use of Federal funds without papering them to death. We need that flexibility.

Another way that we can increase our effectiveness is flexibility, wouldn't it be nice if the Federal agencies actually were able to carry cost savings achieved in one year over to the next year?

This and many other examples are vested in the efforts that we have seen on a small scale in our partnership efforts, and we look forward to working with the committee to see how some of these may be applicable to the broader picture.

Thank you very much.

Senator BAUCUS. Thank you very much, Mr. Tilt.

Finally, Mr. Jordan?

STATEMENT OF DAVID R. JORDAN, ASSISTANT ADMINISTRATOR, INDIANAPOLIS AIR POLLUTION CONTROL SECTION, ON BEHALF OF THE ASSOCIATION OF LOCAL AIR POLLUTION CONTROL OFFICERS

Mr. JORDAN. Thank you, Mr. Chairman. I would like to submit my statement for the record and summarize that statement at this time.

My name is David Jordan, and I am Assistant Administrator of the Air Pollution Control Section for the city of Indianapolis. I appear today on behalf of STAPPA and ALAPCO, the two national associations of air quality officials in the 55 States and territories and more than 165 major metropolitan areas across the country.

I am pleased to have this opportunity to present the views of STAPPA and ALAPCO on the relationship of Federal, State, and local governments in implementing environmental statutes.

With respect to environmental protection, the Federal relationship with State and local agencies is indeed a critical one. As air pollution control officials, we are particularly fortunate to have the Clean Air Act Amendments of 1990 as the framework of our efforts. After two years, our associations still believe this is a fine piece of legislation and we applaud you, Senator Baucus, and your colleagues on this committee for your role in developing this comprehensive and effective statute.

The Clean Air Act Amendments of 1990 assign distinct responsibilities to various levels of government. The Federal Government—and the U.S. Environmental Protection Agency in particular—is charged with responsibility for developing National Ambient Air Quality Standards, promulgating Federal regulations, and providing technical assistance and training for air regulators. In turn, State and local air control agencies are called upon to carry out the permitting, monitoring, and enforcement provisions of the Clean Air Act.

Although the statute is explicit in its allocation of roles, it remains clear that all levels of government share in the ultimate responsibility of providing the public with clean, healthful air. As former EPA Administrator William Ruckelshaus once noted, the public does not distinguish among levels of government. If any one of us fails in meeting our obligations, we will all be held accountable.

Fortunately, over the past few years the working relationship between State and local air quality officials and EPA has developed into a cooperative and mutually beneficial partnership. We are optimist that under the Clinton-Gore Administration, this partnership will be strengthened further. To ensure such strengthening, we will look to EPA not only to increase its pace and meet the statutory deadlines for issuing regulations and guidance, but also to support State and local efforts to implement additional innovative air quality control measures.

If EPA is unable to meet its obligations as stipulated by the Clean Air Act, a domino effect will occur. This uncertainty related to Federal requirements makes it difficult for State legislatures to know how to craft their programs and regulations. This can cause delay in State adoption of regulations, which in turn will result in likely missed statutory deadlines, imposition of sanctions, and failure to provide clean air to our citizens.

Further, in many areas of the country attainment and maintenance of the air quality standards will require the implementation of additional control measures beyond the minimum requirements of the Clean Air Act. We stress the need for EPA to facilitate and support innovative State and local measures, including opting into the California LEV Program; implementing more stringent fuel standards; and utilizing market-based economic incentive strategies on a broader scale.

Efforts to comply with the requirement that all moderate and above ozone nonattainment areas reduce emissions of VOCs by 15 percent by 1996 illustrate how closely Federal, State, and local responsibilities are tied with respect to implementation of the Clean Air Act Amendments of 1990. It is becoming increasingly evident that timely State and local compliance with this important requirement is very much dependent upon EPA development and issuance of regulations, guidance documents, and other technical tools in advance of our November, 1993 deadline.

A final issue related to the success of the Federal, State, and local partnership is that of funding for air programs. State and local air quality officials are pleased that Congress had the foresight to include a provision in the Clean Air Act Amendments of 1990 calling for the assessment of permit fees. Such a provision

would also be well placed in legislation addressing other environmental media. We note, however, that State and local air quality agencies will still depend upon the continuation of Federal grants under Section 105 of the act, as well as State and local appropriations, to fund additional components of the air program. We therefore urge Congress to provide EPA and State and local agencies with the resources necessary to comply with the mandates of the Clean Air Act in a timely manner.

Once again I thank you for this opportunity to testify today, and on behalf of STAPPA and ALAPCO, I offer to you whatever assistance we can provide as you continue to evaluate this important issue.

Senator BAUCUS. Thank you, Mr. Jordan.

I asked Ms. Browner to give a grade to her assessment of the Federal-State relationship. She gave it a B minus.

Mr. Jordan, what grade do you give?

Mr. JORDAN. In the air field, I would give EPA a B. I think we have had a fairly good working relationship in the past. Some of the problems that we have had have been with the timely issuance of guidance and with regulations.

Senator BAUCUS. And you're only qualified to assess the air?

Mr. JORDAN. I'm only talking about air, that is correct.

Senator BAUCUS. OK, a B in air?

Mr. JORDAN. Yes.

Senator BAUCUS. You don't know about the rest?

Mr. JORDAN. That's correct.

Senator BAUCUS. OK.

Mr. Jorling?

Mr. JORLING. I think it is important to separate it by program. I would agree that a B in air is an appropriate grade. I think it's an A minus in water. The SPDES Delegation Program is a much more effective delegation program than——

Senator BAUCUS. You're talking about the Clean Water Act?

Mr. JORLING. The Clean Water Act.

It's probably a C minus or worse in RCRA, but that is because the RCRA statute is a less efficacious statute in its structure than the Clean Air Act or Clean Water Act.

The Safe Drinking Water Act, I think, is probably in the neighborhood of a B plus or A minus, but that's a delegation that goes to our State Department of Health.

But when you take a net grade representing the relationship across all of these programs, the regulated community would probably evaluate it somewhere around a C or a C minus. The regulated community still sees a great deal of complexity and a great deal of overlap and redundancy between the State and Federal Governments They wonder why it takes so many people to accomplish a very targeted task at a given plant site. So from their perspective, I think they would grade it much lower.

Senator BAUCUS. Was it a C or C minus, from a State administrator's point of view, with a B for air and A minus for water, C minus for RCRA?

I guess from the point of view of the State regulators, you give it a C or a C minus.

Mr. JORLING. I would give it a net grade of B or B minus, because I think we're accomplishing a great deal of environmental protection. I think if we look into the future and the directions that multi-media and integrated facility management will take us, we're in danger of having that grade go down rather than up. We must be clever enough to develop new devices, and new methods of implementing programs in order to improve the efficiency of the Federal-State relationship and the efficiency of the regulatory process with the regulated community.

Senator BAUCUS. All right.

Mr. Udall?

Mr. UDALL. Let me give it in two ways.

One, as a general grade in terms of all the national Attorneys General as a group, my chief staff person here on the environment tells me it is a C. Then let me talk a little bit about the enforcement side——

Senator BAUCUS. Very briefly, because I have many questions.

Mr. UDALL. OK. On the enforcement side, in the State of New Mexico, I would say a D minus or an F, and I have some specifics to give you as to why.

Senator BAUCUS. But overall, a C?

Mr. UDALL. Overall, from the National Association of Attorneys General, a C.

Senator BAUCUS. All right. Thank you.

Mr. Tilt?

Mr. TILT. Since grading has to do with education, I think the EPA has to take the same grade as the public would test out, which would be an F.

Senator BAUCUS. An F?

Mr. TILT. An F.

Senator BAUCUS. You mean our environmental statutes have had no effect?

Mr. TILT. No, but in other words, if we went out and did an environmental literacy survey right now of your constituents and everybody in this room, assuming that an F is 60 and below, we can be sure it would be less than that, it's not EPA's sole responsibility. All the other Federal agencies and the States, myself included, would have to share in that ranking.

Senator BAUCUS. All right. Now, down the table.

Mr. Jordan, what's the best part of this relationship? What's working?

Mr. JORDAN. I think the best part in air is that we are able to communicate with EPA. We are able to talk about the issues. We are able to talk about the technical steps that need to be taken to come into compliance to achieve air quality objectives.

Senator BAUCUS. You have a good relationship and you can talk to EPA on air?

Mr. JORDAN. That's correct.

Senator BAUCUS. OK.

Mr. Jorling, what is working best in the Federal-State relationship?

Mr. JORLING. The delegation process where a State has complete delegation of a program and carries that out. EPA reviews it and basically concurs in it. That happens where the number of pollut-

ants are all fully delegated, which is a rarity under the Clean Water or Clean Air Acts.

Where the responsibility is shared by the Federal Government and the States, the Federal-State relationship then breaks down drastically.

Senator BAUCUS. Where it's well defined, like Safe Drinking Water, it works better when it's a complete delegation? Is that correct?

Mr. JORLING. Where the entirety of the responsibility and accountability is held by the State, then the relationship works, yes.

Senator BAUCUS. An example would be Clean Water?

Mr. JORLING. Yes.

Senator BAUCUS. OK.

Mr. Udall?

Mr. UDALL. I would say the best thing we have going is Carol Browner and the commitment she made to the Nation's Attorneys General to work with us on enforcement, to join in a partnership and set up this joint strategic planning conference. It just seems to me——

Senator BAUCUS. I'm talking historically. Based upon past experience—not intention, but experience—what works best?

Mr. UDALL. What works best in terms of past experience? In my mind, what works best in the enforcement area based on past experience is direct funding to the people who are doing the enforcement. You look at the drug area. Massive amounts of money were put in specifically for prosecutors and you got enforcement, that kind of thing.

Senator BAUCUS. Mr. Tilt?

Mr. TILT. I think what is working best is that we've heard a lot about partnerships, and people are actually starting to figure out what they are, how they work, and what the game plan is, so that the States understand that they can get the flexibility from the Federal agencies and are starting to recognize that they can bring in the private partners.

Senator BAUCUS. Best example?

Mr. TILT. Best example, the North American Waterfowl Plan, the Bring Back the Natives Fisheries Restoration Program. The Big Blackfoot River in your State would be a great example; the U.S. Forest Service, the Bureau of Land Management, and the State of Montana. Trout Unlimited. Even Robert Redford is getting in there to help restore one of your blue ribbon fisheries.

Senator BAUCUS. It would have helped if he had actually filmed on that river.

[Laughter.]

Mr. TILT. It would have, but then you wouldn't have seen any trout in the film.

Senator BAUCUS. Oh, there are a lot of trout in that river.

My time is up. Senator Chafee?

OPENING STATEMENT OF HON. JOHN H. CHAFEE, U.S. SENATOR FROM THE STATE OF RHODE ISLAND

Senator CHAFEE. Thank you Mr. Chairman. I have a statement I'll submit for the record.

[Senator Chafee's statement follows:]

OPENING STATEMENT OF HON. JOHN H. CHAFEE, U.S. SENATOR FROM THE STATE OF RHODE ISLAND

It is hazardous to make any generalizations about intergovernmental relationships in the environmental field. Each environmental law has its own intergovernmental framework. They range from the program to control underground injection that allows state programs to be less stringent than Federal regulations to air quality planning where State Implementation Plans—plans developed by the states—are promulgated as Federal regulations.

Each program is also in a different stage of maturity. Right now the very new drinking water regulations are aggravating our partnership with the states and cities. But there was a time many years ago when the principal dispute between EPA and the states was the backlog of Clean Water Act permits. Today the partnership on Clean Water is quite solid.

Finally, EPA administers its side of the partnership through ten different regional offices each having its own character and giving the states and cities 10 different views of the Federal Government. It is a very complex system.

But we can recognize some concerns that are cross-cutting. There are two factors that have been changing the Federal-state relationship in recent years. One is very tight budgets. When budgets were more generous both here and in state capitols, it was easier to resolve disputes about priorities. When budgets are tight it is hard to accept Federal mandates for programs that are of less urgency from a state perspective.

The second factor is capacity. State capacity has increased dramatically. The frontline experience that comes in a state agency often gives the state official expertise that cannot be acquired by the Federal counterpart who provides only oversight. Old arrangements that cast EPA as the senior partner are no longer appropriate for many of these programs.

These same factors have also affected our relationship with local governments, but there is another element that has also come to prominence in the Federal-local relationship just recently. Local governments deliver services—drinking water, sewage treatment, and solid waste disposal. As service providers they are part of the regulated community under our environmental laws. They are subject to enforcement actions when the laws are violated and to claims for cleanup costs for past decisions. Aggressive enforcement against local government is a relatively recent phenomenon.

Industry is no longer the principal source of complaints about Federal environmental law. Government officials, state and local elected officials, are now the source of the loudest and most numerous complaints.

We need to repair these relationships. We need to restore the foundation of mutual respect that must be present if these statutes are to work. The Federal Government needs to recognize the capacity of our partners by involving them more directly in drafting our plans and regulations. We need to respect the diversity of their objectives by giving them more flexibility in times of tight budgets.

But on the other side, state and local officials need to step back from the daily disagreements and look again at the value of national goals and standards in this partnership. I remember well the time that Secretary of Transportation Pena appeared before the committee when he was still the Mayor of Denver. He was here to testify for the imposition of Federal sanctions on cities that did not meet Clean Air Act standards. He needed the threat of Federal penalties to force decisions for better air quality in his own community.

I don't know that it would be possible for the State of New York or the State of Rhode Island or for any other state to maintain a strong environmental program without the assurance that all the other states were at least at a minimum level of environmental protection set forth in our national environmental statutes. As we adjust our programs to reflect the new factors at work at the state and local level, we should not dismiss the value of a strong Federal partner in these endeavors.

Senator CHAFEE. There are just a couple of points I would like to make here.

First, lets see if you gentlemen agree with this. State expertise has increased dramatically over the last several years. So it is no longer appropriate for EPA to be the senior partner in the arrange-

ment. Is that a fair statement, do you think? Mr. Jorling, you've been pretty close to the States.

Mr. JORLING. It is very fair, Senator. In fact, very often people use my own growth experience over the last 25 years as an example. When I sat in chairs behind you, people asked me what was the best thing that you could achieve for environmental protection—this was in 1968—and I said, "abolish the States."

[Laughter.]

Mr. JORLING. Now that I'm in the position that I'm in, and it's not just because of where I sit——

Senator CHAFEE. How about abolishing the Federal Government?

[Laughter.]

Mr. JORLING. You could abolish the Federal Government.

There has been a tremendous increase in the expertise of State governments, organizationally and professionally, that now has to be reflected in the nature of the Federal-State relationship.

Senator CHAFEE. Let me just say this also, that it seems to me that industry is no longer the principal source of complaints about Federal environmental laws. We're not hearing it from industry. We're hearing it from State and local officials. They are the loudest "complainers," and I don't say that in a derogatory manner.

However, the Federal Government still has a role to play. I will never forget that when now-Secretary of Transportation Peñea was sitting out there as Mayor of Denver, one of his points was that he wanted the Federal Government to impose the threat of sanctions in order to get better clean air quality standards and achievements in his community. He needed that threat from us.

Having been in government—Mr. Udall knows this, as a Governor—there's nothing that makes the State Legislature shape up more than to say, "The Council requires such-and-such be done," and then they would all go and do it.

Also, I think there is another point to remember here, and that is, I don't know how, in the State of New York or the State of Rhode Island or Montana or anyplace else, we could maintain strong environmental programs without the assurance that the other States were at least having a minimal environmental protection standard likewise. We have tremendous competitive pressures, saying, "You're forcing us to do things that they're not doing next door in Connecticut or Massachusetts." So I think we've got to remember that fact.

Mr. JORLING. Senator, if I could just amplify on that, Governor Cuomo considers the relationship between and among the States now as cannibalism in the competition for economic activity. It is clear that the three principal respnsibilities of the Federal Government should be: one, setting national minimum standards for health and technology; two, being the gorilla in the closet to assure the integrity and steadfastness of the Federal program; and three, assuring that there is a level playing field across the States by focusing on the States that are not performing as well as the other States.

So you are right on the mark on those points.

Senator CHAFEE. Let me ask you a question that has bedeviled me. We have situations—I'm harking back, now, to Superfund, which I think you gave an F to, didn't you?

Mr. JORLING. I would give it an F or an F minus.

[Laughter.]

Senator CHAFEE. I haven't found you to be a hard marker because you gave overall higher marks.

What are we going to do about Superfund? Let me give you a specific illustration that has probably come up in your States.

We have an area in our city where there was one a plant. The plant is now closed and the place is up for sale. It has everything that should be necessary for industrial development. It has sewage and water. There is another plant that wants to locate there instead of building a new facility on some local agricultural land outside the city, they prefer to locate in the city. They have a community sense, they want to be available to inner city low-income individuals who would not need to come there to work. But because of this Superfund problem, they're just not touching it.

Do you have situations like that, Mr. Jorling, where you have a potential industrial development site, with the sewage and the water, and everything being there, but because of Superfund, no one will locate there. Not even putting it into the Superfund category, not being one of the listed sites, but being a place where there is hazardous waste material? Do you have that, and what do you do about it?

Mr. JORLING. Senator, we have many such sites. I agree with you that the preferred development pattern would be to in-build, or to use degraded landscapes for productive purposes. In fact, I believe that was a large measure of the objective of Superfund. In New York we have a program under our own law which is functionally—and actually, in some respects—larger than the Federal Superfund program. We have a $1.4 billion bond act to support our State Superfund. We are implementing our State law with preference to restoring economic development sites, so that we are attempting to focus the power and resources of the program on activities necessary to make those facilities redevelopable, whether they be waterfront sites, or other industrial landscapes that have been degraded around the country——

Senator CHAFEE. My time is up, but——

Senator BAUCUS. Go ahead.

Senator CHAFEE. Is the Federal Government a help in doing this? Or are they a hindrance? Or are they of no consequence? What do you do?

Mr. JORLING. We think our relationship with EPA on Superfund is quite good. However, that still does not mean it is being implemented——

Senator CHAFEE. I thought you gave them an F.

Mr. JORLING. I would give the program an F, and I would give it an F because it doesn't have a delegation component in it, and it needs delegation. In a State like New York or New Jersey, and perhaps in a State like Rhode Island—although I'm not as familiar with Rhode Island—the implementation of Superfund should be delegated. There are some things that need fixing in Superfund. I think the statute of Superfund needs more fixing than the implementation mechanism.

However, there are some conceptual problems that stand in the way. The question is often asked "How clean is clean?" How clean

do you make a site before you permit the redevelopment of that site?

Senator CHAFEE. Who is "you"? Is it the State, in your case? Let's say you have a site that you think is where a business should go, instead of going out to some pristine, undeveloped field that you're going to tear to pieces to make a parking lot out of. You think it should be right in there, but the previous occupant has left a mess. Not an unsolvable mess, but a mess, and you are familiar with these.

Mr. JORLING. In a State site, we make the decision in the New York State Department of Environmental Conservation. Where it's a Federal Superfund site, it's a joint responsibility.

Senator CHAFEE. That's where it's a listed site?

Mr. JORLING. That's correct.

Senator CHAFEE. Well, let's say it's less than that, it's not in that category.

Mr. JORLING. Then the State makes the decision as to what the cleanup objective is; who the responsible parties are that will contribute to remedial costs, if any can be identified, and what their proportionate share should be.

One of the things that is happening now is that there is an attack on the concept of strict, joint, and several liability. I think that attack should be opposed. But that doesn't mean that there shouldn't be guidance given to enforcement personnel in the actual conduct of settlement negotiations, on the kinds of deals that can be made. Right now we reach a point of paralysis because we can't make a final decision about who is responsible for what portion of any particular cleanup. We need to give the prosecutors the enforcement guidance—and we think we've given that in New York—so that they can make a deal, set a cleanup standard, and get on with the project so that you can restore the area to economic viability.

Senator CHAFEE. Well, suppose you didn't clean it up?

Mr. JORLING. If you don't clean it up, it will remain a continuing risk. It will remain a continuing liability to the community.

Senator CHAFEE. You mean it would get into the groundwater in some fashion?

Mr. JORLING. Yes. It remains an unusable landscape, and that's the consequence that all too often results from inaction. I think what we need is to make sure that movement toward settlement is rewarded, so that decisions can be made and implemented.

Senator CHAFEE. Well, I have used my time, but what worries me about this whole business—and we've got an actual case of this at home that has disturbed me—is that if you go in and you try to clean it up, what do you do with the dirt? You ship it to Alabama or someplace? And then who says it's clean?

Mr. JORLING. You touch on another set of crucial Superfund issues: management of remedial waste. This gets back to education. We have learned a great deal. We have developed technologies now that are very good technologies, that can protect health and the environment But we have not yet succeeded in persuading the public that that is the case. The public still does not trust Government or the private sector when we say, "If we pursue this remedial technology, it will be one that will ultimately produce a viable land-

scape and one where the risks associated with it are acceptable." We need better public education. I have argued many times that the reason we cannot get an advanced technology to remediate a site—for instance, bring a temporary thermal combuster in to remove organic contamination from a given medium, soil or what have you—is because so few of our citizens are now taking chemistry and physics. They simply don't know what oxidation is. So when you say "combustion and incineration," stark visions appear in their minds about some kind of vile outcome. Incineration is oxidation. It is the preferred way of destroying an organic chemical. If the people don't respect that, and they distrust the Government in making decisions, then again we are confronted with paralysis.

I can give you an exact example of that sort. The Croten Railroad Yard in New York is where many railroad systems were managed. All the degraded oil products from the railroad operations were dumped in a lagoon approximately 50 feet from the Hudson River. We selected a remediation project that would have brought in a temporary, high-technology thermal destruction facility, run the material through in six months, and had a completely restored and reusable landscape in the end. The people in the area considered that technology to be threatening to their health. I had to relent. The cost of our project was $7 million; the alternative was to excavate that material and send it to a dedicated incinerator in Texas. An additional $8 million of New York's money went to Texas in order to accomplish a lesser remediation.

We had done a comparative analysis of the risks associated with the temporary thermal destruction unit and found that it took 100 of those incinerators to equal the emissions from one automobile. When I announced my decision at the parking lot in the railroad station, I said to the people there to protest the project, "If you are concerned about your health, there are 2,500 uncontrolled incinerators that are going to start up at 5:00 o'clock and do great damage to your health." One hundred incinerators equal one automobile's emission, yet the people don't respect that kind of comparative risk. This is a problem that the Congress has and it's a problem that we in the States and the Federal Government have: building respect and trust in the choices that we make, and showing the new technologies that we have and the sophisticated science that is available to support them. That's one of the problems that we have with these kinds of projects.

Senator BAUCUS. Thank you very much. That's a very important point? Could you expand on that a little more? Frankly, I think it goes to the heart of all the hearings we've held so far this year in preparation for the reauthorization hearings and markup; namely, how we get better information, how we properly use science, how we make the connection between the problem and the remedy better than we have, to better develop the trust that I agree is lacking right now.

You've spent a lot of time with this subject, Mr. Jorling. Any other thoughts? Should more resources be dedicated to the science? I'm trying to find some ways to get more common ground between the environmental community on the one hand and business on the other. Perhaps one approach would be the concept of sustainable development, because theoretically, on the surface, there is a

common ground there. We look at environmental technologies not only from the abatement point of view, but prevention, life cycle, up-the-stream, and so forth, so that we fully internalize the environmental externalities.

It's a basic subject that we're all grappling with here. Do you have any other thoughts on how we can deal with that? I think you're right, if people would put their emotions aside for a little bit—emotions are critical and very important in life—but if we only live by our emotions, we're basket cases. We also have to use our minds and logic and reasoning capabilities. How do we get the two functions together better? That is, get the information—not dishonest, but accurate information—better in line with public policy?

It's a broad question, but just basic thoughts that you might have.

Mr. JORLING. I think the key is professionalism and steadfastness in moving these projects forward. But there are a couple of other elements that are essential.

The decisionmaking process has to be open. You have to remember that public attitiudes may have been shaped by decisionmaking that occurred in this Nation decades ago. It was done in secret, and it was an abysmal failure. It was the regulation of nuclear energy and it was all done behind closed doors. It was done by "experts," by Ph.D.s all of them. They made fundamental errors, the consequences of which we currently suffer in trying to find high-level radioactive waste disposal facilities. So you cannot assume that the expert who exudes a "trust me" will be reassuring to the public. Decisionmaking needs to be conducted through open processes, but there needs to be a cultivated field supporting those open processes, and that means better education. It means cultivating the people and helping them understand comparative risk: how to evaluate the kinds of risks that we are exposed to; measuring which ones are most risky to their health and welfare; and addressing those and setting aside some of those that are less risky even if they attract more prominence.

That's going to take a great deal of quality effort on the part of State and Federal officials, but it has to be open and fully explained. Over time, we are going to get respect.

There is another fundamental factor. We are supporting the effects of an Administration which through the 1980's pronounced Government "bad." The Government and the regulated community suffered because the people began to believe that notion. That was a very fundamental attack on our principles. We now have an Administration that believes in Government.

So I think if we stay steadfast and build the kind of climate that respects Government and respects public decisionmaking, we'll get back on track. But it's not simple, Mr. Chairman. I remain, especially in specific projects, extremely frustrated about my inability and my department's inability to convey an understanding of comparative risk that persuades the public.

Senator BAUCUS. Thank you, Mr. Jorling.

Let me ask the same question to you, Mr. Jordan. How do we get at this problem of proper information to build trust and so forth? Tom Jorling has a big State, New York.

Mr. JORDAN. That's one we're struggling with on a local level as well in terms of having a very complicated set of regulations that we're trying to put in place. We're now providing the public much more of an opportunity to come in and examine the work that we're doing in terms of having permits that we issue available to the public——

Senator BAUCUS. When you make a decision which you think, based upon science and good public policy, is the right one, do you run into the same problem that Tom Jorling mentioned, namely, that sometimes the public has a different perception that is much more wasteful, much more expensive, much less healthy?

Mr. JORDAN. Yes, we do.

Senator BAUCUS. How do you deal with that?

Mr. JORDAN. We've dealt with it in a couple of different ways. We've tried to get coalitions of people together to sit down and have roundtable discussions about particular environmental issues so that some of the very real concerns from each side can be expressed to each other. And very often we have found that in that type of a forum we can reach decisions that are acceptable to all parties. Oftentimes we reach solutions without going through a contentious process where people tend to overreact, leading to a situation where you are never able to reach any type of consensus.

One of the things we've tried to do is have some very real and very open discussions up front to try to make people more aware of what the issues are and to try to understand better what people's concerns are about these particular projects.

Senator BAUCUS. Does one glaring example come to mind?

Mr. JORDAN. One example that comes to mind that we've dealt with within the city of Indianapolis is a waste to energy incinerator. Several years ago we had a process that we went through where we formed an environmental subcommittee that dealt with review of the environmental standards that that incinerator would meet. We were able to issue a permit for that facility without going through some of the protracted debates that have happened in other types of situations with waste energy incinerators.

Senator BAUCUS. So what lessons can we learn that address the subject of this hearing, based upon that example?

Mr. JORDAN. I think it would be to involve the public early on; try to understand what the public's concerns are; try to express to the public, in terms that they can understand, what the technical issues are and how best to address those. In many cases there are different types of control options; we must explian what different control options mean with respect to different environmental effects and different costs, what that translates to.

Senator BAUCUS. OK.

Mr. Udall, your reaction to all this, your thoughts, your advice?

Mr. UDALL. One example in New Mexico—and this is along the line of the radioactive waste example that Mr. Jorling gave—are the MRS sites, which are for the intermediate storage of high-level waste in States. I very much opposed the one that was going to be located on an Indian reservation in New Mexico. But I noticed that the process that was used, the legislative process that you set up, allowed for grants to bring in mediators and facilitators so that the

comparative risk information that Mr. Jorling was talking about could get out into the community.

When the Federal Government came in—and I'm sure this could be adapted when the States do the same thing—when they came in and said they were going to do a specific project, they allowed money to be allocated to hire a mediator or facilitator, go out and bring the affected people in, to pull the educational material together that was needed to be conveyed to the public, and then at the same time allow the public to become educated on the subject.

In this particular case, I still think there was an incredible amount of distrust and terror for the nuclear process, a lot of it engendered by the secrecy that he talked about. But I think that that's something that I noticed that probably could make a difference in some of the cases where you're dealing with misunderstanding and mistrust about a particular process or project.

Senator BAUCUS. Mr. Tilt?

Mr. TILT. Obviously, being from the State of Montana, you understand what reaction "I'm from the Government and I'm here to help" will get. I think that does speak to a decade or so of literally tearing down the Federal agencies, undeservedly.

The other thing is that science tends to be extremely arrogant in its portrayal, and nowhere will you see this more evident than in environmental technology. Even those of us who are somewhat trained in that are quickly left behind as they go through their statistics and all. Clearly, the public doesn't trust statistics——

Senator BAUCUS. What do you mean by arrogance in this case?

Mr. TILT. In that the public can't understand this concept——

Senator BAUCUS. It's too complex?

Mr. TILT. Yes, "It's too complex for you; so just trust us." And we've seen this—I was extensively involved in dredging hearings throughout New England when containment and other things were being looked at for harbors such as Fall River. There was constantly, both in the case of the Corps and their contractors, this concept that people could not understand the basic hydrology and physics they were talking about. Their reaction is predictable.

The response I would offer? Members of this committee a number of years ago participated in kind of a novel approach with the U.S. Navy to look at the disposal of plastics at sea. You can imagine the Navy having to lay its braid down long enough to actually invite representatives from Greenpeace and other environmental groups, as well as Congress, on board their aircraft carriers and all, to actually go into the bowels of the ship and look at what they were doing with their waste.

But the process, which started with the braid versus these wide-eyed draft-dodgers, quickly coalesced into both sides having a much better understanding of what the other side had to deal with.

So if you start early enough with a mediation process, but without the binding arbitration, you can come to good solutions, especially on a more local level where the people who are affected feel that they have had some say in it.

The final thing you will always face is this. As long as people think they can get away with NIMBY, "Not In My Back Yard," if they feel they can ship their problems out of State, then I think that will always be the preferred alternative——

Senator BAUCUS. You're saying that people should not get away with that?

Mr. TILT. Ultimately, no. I don't think Senator Chafee would want to send his waste to Alabama, and I'm sure his colleagues from Alabama might share that. In fact what is needed is the beginning of an understanding that if it was made in Rhode Island, it should stay in Rhode Island. And I think that's exactly what was being proposed by Senator Chafee. How do we get the ability to do that in the city of Providence.

Senator BAUCUS. OK.

Mr. Jorling, put yourself in Ms. Browner's shoes. You once worked at EPA. She hears you and other State administrators say, "Hey, delegate more to us; we have a lot of resources now, a lot of experts, we know how to run these programs. In fact, in many ways we can run them and do run them better than EPA." She is charged, as Administrator of EPA, with being sure that these statutes are properly enforced. That's her job; she took an oath of office to enforce those statutes. So she has certain concerns about delegating too much, not being—if not in control, at least not being fully informed of what's happening.

So how would you address concerns that she might have when you and other State administrators say, "Hey, delegate to us"?

Mr. JORLING. I think the key is accountability. The fact is that we have a rich and diverse Nation, and walking in her shoes is a difficult process to even conceptualize because the 50 States are not equal. There is a gradation when at one end are quality programs and at the other end there is nonquality. In addition, some specific programs that are arrayed across that spectrum differ within a State.

So, there must be qualitative analyses and judgments made about what States we can take what risks with, and then hold those States accountable.

Senator BAUCUS. Those are nice big words.

Mr. JORLING. Yes.

Senator BAUCUS. Give me some examples of what that really means. Apply that.

Mr. JORLING. Let me take a specific example. The Clean Water Act delegation relationship has several component programs in it. In New York, we have received delegation for everything but pretreatment. The pretreatment program involves regulation of indirect discharges. We have not received that delegation because EPA has concluded that we do not have, within our current capabilities, sufficient resources to carry it out the way the textbook says it should be carried out. Therefore——

Senator BAUCUS. Maybe they are right.

Mr. JORLING. Except for the fact that they don't have the resources to carry it out according to the textbook. In fact, we have nine people on our payroll who are working on pretreatment regulations. EPA Region II has four people and some contractor support. The EPA staff are often doing other things, but they can not award delegation because there is a work plan that says until New York gets 16 people, they're not going to give us that delegation.

Senator BAUCUS. Is 16 the right number of people?

Mr. JORLING. According to that textbook.

Senator BAUCUS. According to your opinion?

Mr. JORLING. That's not the way the real world operates. In a program like SPDES, when permits are issued to major dischargers, you address the most important ones and then you move to the remainder if you have the "textbook" resources available.

Then you have other programs such as nonpoint sources, and pretreatment. What happens when you get complete delegation of the water program is that the State can make the judgment to shift resources away from the lower priority major dischargers and put them into higher priority pretreatment needs."

Senator BAUCUS. All right. Now, how is EPA to be assured? Let's say they delegate the pretreatment program.

Mr. JORLING. They review our performance.

Senator BAUCUS. What do they review? You hear this complaint that they review too often the number of permits issued, the old bean-counting argument. What should they review to basically assure the public that the environment and public health are being protected?

Mr. JORLING. They shouldn't review the number of permits issued. They shouldn't count the number of inspections. They should spot-check how much pollution is coming out of the pipe.

Senator BAUCUS. So the basic answer, to assure confidence in delegation, is to spot-check——

Mr. JORLING. Performance.

Senator BAUCUS.—performance? Give me some examples of how you would measure that performance. Spot-check of stuff coming out of the pipe is one category. What else?

Mr. JORLING. Well, that's the most effective, but they can also send a team of people in to interview our people to see, qualitatively, how good a job we are doing.

Senator BAUCUS. Why don't they do that?

Mr. JORLING. Because the evolution through the last 25 years has been toward paper analysis.

Senator BAUCUS. It's bureaucracy and inertia?

Mr. JORLING. That's right. Bureaucracies tend to say, "I can compare your paper against my grading sheet much easier than I can walk into a room and talk to your officials and form a judgment as to whether you're doing a high quality job"

Senator BAUCUS. Would EPA agree with what you are saying, basically?

Mr. JORLING. I think so.

Senator BAUCUS. How do we help make that happen? That is, this kind of delegation along with qualitative performance review, how do we help make that happen?

Mr. JORLING. I said I would submit some legislative language which would give some discretion to EPA and to the States to implement programs coherently.

Senator BAUCUS. That's right.

Mr. JORLING. That's one very important step. Right now, for instance——

Senator BAUCUS. Would EPA agree with that?

Mr. JORLING. I think so. Again, I can't speak for EPA on that specifically.

But for instance, when we get a grant from the Clean Water Act for a program, we have green eyeshades and they have green eyeshades, and they say, "Was the money that we gave you, New York, used to support a water engineer?" And if I say, "Institutionally, that water engineer also did an air inspection," they say, "No, you can't do that."

Senator BAUCUS. Right, I understand.

Mr. JORLING. So you can't have that kind of micromanagement. You have to be able to say, "We went out to a facility and we inspected total environmental media compliance."

Senator BAUCUS. Your proposed statutory change addresses that, correct?

Mr. JORLING. It would give EPA's green eyeshades and my green eyeshades the comfort that the money is being spent properly.

Senator BAUCUS. OK, but in addition what can we do to help assure this qualitative performance review to enable more delegation, besides allowing the integration of various media?

Mr. JORLING. I think what Congress can basically do is give the direction—and in this case it's not necessarily statutory direction—but give the policy direction, as to what you expect. If that's what you expect, then that gives her the strength to manage her bureaucracy in new and innovative ways. That's what I think she needs. She needs support, the knowledge that she's not going to be undermined. She needs to know that she is reflecting the clear consensus from the Congress that we need to have more respect.

Now, there are some real obstacles. There are States that are recalcitrant. There are States where the implementing agencies are diverse. In New York State, one agency performs most of the same function as EPA does. Many States separate those functions among several agencies. It may be that Congress should encourage the States to develop mirror-image agencies to EPA to improve this efficiency and allocation of resources.

Senator CHAFEE. Let me ask a question if I might, Mr. Chairman.

What you are saying, Mr. Jorling, is a complaint that we've heard for years from the States in the so-called categorical versus block grants, in health programs. "You sent us so much money for tuberculosis, and the woman who was doing that was doing a little bit in heart, but no, no, she can't do that because we're only paying you to watch after tuberculosis. You can't allocate any of your time to heart. If you're going to do any heart work, then charge it to the heart program."

I spent a lot of time on the receiving end of this as a Governor, so I thought it was nonsense, and I'm not sure it isn't nonsense. Here's the program that you talk about, because you've gotten money for clean water, and the person is doing a little bit of clean air work, and that's not permitted.

I can see that. They might be using the person who is taking the clean water money to do some athletic programs someplace, for all we know. But I suppose you've got to have a certain amount of trust develop between the Government and the State. Now, how you do that—you can say that New York State is a good behaver, so we're not going to be checking them every 10 minutes, whereas another State might not be. Maybe that's one way to go.

Getting back to your pretreatment problem, I was stunned by that. You know, Jackie Schaefer was your EPA Regional administrator, and we all know her and she's a reasonable person. You would go to her and she would say, "No, no, we're not letting you do your own pretreatment because you don't have 16 people, you only have 11"?

Mr. JORLING. Unfortunately, Jackie left before I became Commissioner, or I think we would have had a deal a long time ago.

But it comes down to the degree of microcomparisons. The impediments occur when the EPA attorneys say, "Mr. or Ms. Regional Administrator, until you've got satisfaction of everything in this grade book, you can't legally delegate," or when the budgeteers say that until they've got the exact number of people for the workload that's out there, you can't delegate.

The fact is, none of us, neither EPA nor the States, have the ability to furnish resources to satisfy all of those textbook workloads that are out there. We all make judgments about what's at the bottom end of that system and apply our resources to the top end.

Let me give you another example. We did an analysis in New York. I said to the air people, the water people, and the RCRA people, "Tell me how many facilities in New York State contribute 95 percent of the loading to the environment in your media." Then we took that list and we aggregated it. It turns out that 400 facilities in New York are responsible for 95 percent of the loading into the atmosphere, into the water, and into the RCRA process. That's a meaningful universe that I want to apply my resources to; but in effect, EPA says, "Don't issue 400 permits to regulate that dominant loading." They say, "Issue X number of permits in RCRA, X number in water, and X number in air," even if they have no relationship to the overall loading to the environment.

What we need is to work with EPA to get them to accept our sense of priorities. We need the kind of flexibility that the amendment I've drafted would provide, and that would allow us to use our funds in a blended way, and allow the procedures to be blended by a State. For instance, you have a permit process in air that is different from the permit process in water that is different from the permit process in RCRA under the statutes. This would say, "Let the State and EPA blend those three permit processes into a single process to improve the efficiency of administration to the regulated community."

Senator BAUCUS. Well, who could be opposed to that? That sounds so reasonable.

Senator CHAFEE. I was going to say, that's overpowering reason. I might say that Ms. Browner's predecessor certainly was a reasonable person, whom you've known for years. Mr. Reilly wanted to obtain the same goals that you did. What went wrong?

Mr. JORLING. It's going to take, one, a recognition that 25 years of history have given us a new level of capability on both sides of the Federal-State——

Senator CHAFEE. That's the increased capability in the States that we were talking about.

Mr. JORLING. Yes. And then, it also requires an authority for States to say to a regulated party, "We're not going to review your permit in two years; we're going to review it in five years, along

with your SPDES permit and your air permit." There are impediments in the legal regime right now to the blending that I've referred to because of the differences in the statutes.

We need to have the authority. If necessary, limit my amendment to a pilot program. I would offer New York as a test case for integrated permitting and enforcement of major facilities.

There are more fundamental impediments that we have to deal with. The people that I hire are trained as sanitary engineers, chemical engineers, or air pollution engineers. They are not trained as systems environmental engineers, and that's the what we need. When my staff goes to a complicated facility and meets with their counterparts in industry, they must understand that if you're talking about bringing down the air emissions, you're not just pushing that pollutant loading somewhere else. That's essential for pollution prevention and multi-media management. You have to understand the system, and in order to do that we have to bring our people together, which we are doing in an experimental way in New York State.

There is another point to be made about the change that has occurred over 25 years. Big industries, complicated chemical industries, petroleum industries, and various manufacturing processes, have also become very competent. Their staffs are equal to Government staffs in knowing how their activities influence the environment. We need more respect for the expertise of industry.

At the other end, and this is a problem that we all face, are the small actors. They need help. If I give a SPDES permit application to a small facility in New York, the managers just throw up their hands. They don't even know who to consult to even allow them to read the application much less understand it. So there are problems at the small end that we need to address.

But the "Big 400" facilities in New York that are contributing 95 percent of the loading, they have good, competent staffs. As a general matter, their corporate management has issued declarations and policies that are as advanced as anything in Federal or State law with regard to their obligation to improve the environment. This needs to be respected.

So we need to take advantage of the knowledge base so that we can regulate more intelligently and more efficiently.

Senator CHAFEE. Well, Mr. Chairman, it sounds like we have possibilities here to do some good. I don't know what the next step is. I suppose it is for you to speak to Ms. Browner, and she must consult with you folks. Of course, she has a pretty full agenda herself down there, trying to get acclimated and squared away.

But do you agree with what he said, Mr. Jordan?

Mr. JORDAN. Yes, I would agree. In the past we have had a tendency to approach environmental problems from a very narrow perspective. We in air have not looked at what types of water, solid waste impacts, or some of our air solutions may have. We do have the problem of technical expertise. We tend to be very technical in certain areas, and we don't have people who are well-trained in a number of environmental media. That is a problem that we would need to address in trying to approach things in a more holistic fashion.

Another problem we would need to address from a local perspective is that in many cases we tend to not have complete environmental programs in the same sense that a State may have. In many cases we may have local air programs, but oftentimes RCRA and water issues might be handled by the State in a given jurisdiction. So we would have to work through how we would integrate local and State agencies in trying to make that process work, as well.

Senator CHAFEE. Mr. Chairman, I have to go.

I thought it was interesting, what Mr. Jorling has done. To get it down where 400 units are responsible for 95 percent of the pollution, boy, that's going where the problem is.

Senator BAUCUS. Thank you very much, Senator.

Mr. Udall, would you agree with what Mr. Jorling said, basically?

Mr. UDALL. Yes, I would, from our perspective.

Senator BAUCUS. From an enforcement perspective?

Mr. UDALL. Yes. I think that when you talk enforcement, you have to have people sitting down at the table and saying from the Federal perspective and the State perspective, "Let's do some of these things." Frequently we find out, with the Federal Government, where we're carrying on an investigation and about ready to take an enforcement action in the environmental area, that they are doing the exact same thing, and we just haven't had the kind of coordination and cooperation that is needed. I am hoping, with the attitude that I'm feeling back here and the attitude from this committee, that we're going to see some changes and break through some of those obstacles.

Senator BAUCUS. Mr. Tilt?

Mr. TILT. One cannot disagree with it, because it's the only thing which truly makes sense, which is to give the States the lead on what's in their own back yard, and use that as the carrot—the stick being that they can continue to let the EPA do it for them.

The only other thing I would offer is that early on in the testimony someone talked about an "IPA from the EPA." I think the best thing that could happen to some of those folks over in EPA is to work directly in the States, on the receiving end, to see how working with some of those regulations actually appears to the States. I don't think that knowledge exists enough throughout the agency.

Senator BAUCUS. Where is the environmental community in all this? When you say "a lot more delegation to States," are they going to be upset? Will they say "The Federal Government is abdicating its responsibility"?

Mr. TILT. Well, if it hurts their membership, they probably will squawk against it, but I think they have to be brought to the table.

Senator BAUCUS. Mr. Jorling, what do you think?

Mr. JORLING. There will be some suspicion. They will want to be at the table in some way, and in some respects, that's a welcome thing.

Let me follow up on this IPA idea. My feeling is that the best way for EPA to evaluate whether New York is doing a good job is to send a group of people to spend three weeks to examining how we do things; what we do; the kind of forces that we deal with; and the decisions that we make. They should evaluate person-to-person.

If they do this, they can judge us very, very quickly. That would shift our environmental technicians into environmental protection and away from filing reports; and shift EPA's staff away from reading reports. The EPA staff needs a sense of what the real world is like.

Senator BAUCUS. So what you're basically saying is that EPA makes a mistake by asking you, New York, to fill out these reports; you send the reports to the Regional Administrator's office or to Washington, where the staff goes through all those reports to see how they match up according to some prescribed notion—rather than sending people out of those offices, going straight to your offices or straight to some site and spending some time there, based on some cooperative arrangement, and therefore get a feel by looking at data and talking to people, reading between the lines as well as listening to the music and the words, and reaching a judgment as to whether you're doing a good job? That's basically what you're saying?

Mr. JORLING. That is correct.

Senator BAUCUS. Why don't they do that? Why don't they just send people out there?

Mr. JORLING. Again, I think it's the strength of inertia over time. When you start a process of paper evaluation in one year, and then 20 years later it has become sort of its own workload, it is very hard to say, "Wait, let's try a different way of evaluation, a different way of measuring performance, a different way of holding them accountable." There's a whole series of people whose full-time jobs are to review paper, and it's a very diversionary effort.

Senator BAUCUS. I strongly agree. One thing I've learned in this job, paradoxically, is that the more I'm not here—the more I'm home, going out and seeing things—I think the much better job I do.

Mr. JORLING. If I might cite an example, Mr. Chairman, in the air field we've heard that resources constrain EPA staff from site visits. We've had certain types of field audits in the past, but EPA has said they've had to scale those back because of staff being moved to other assignments.

For instance, in looking at the permit program that is coming up under the Clean Air Act, we're going to be issuing thousands of permits that EPA will have an opportunity to review. It only makes sense to do this by program audit and to trust the advanced States to do a good job. More oversight should be focused on those States that are not doing a good job, Reviewing each and every permit will not be possible.

Senator BAUCUS. Let's say we go down this road. OK, we're going to set up this procedure where there's more delegation. What is your response to national and multinational companies that say, "Hey, with all this delegation, New York has this set of procedures; Rhode Island has a different set of procedures; Massachusetts, another; then we go out to Montana, and it's still different," and so forth. How do we deal with that?

Mr. JORLING. They are dealing with that now.

Senator BAUCUS. Wouldn't that be a problem with more delegation, is my question?

Mr. JORLING. It may become less of a problem if EPA serves in its fundamental role that Senator Chafee referred to: leveling the playing field among States and acting as the gorilla in the closet to assure evenness among State programs. The big industries know the differences between and among States much better than we in the States do, and much better than EPA does. They will tell us, "The way you write this air permit is very different than the way they write an air permit in Florida or in Texas or in California," and we will then say, "Well, how do they do it differently? And what is the efficacy of that difference? Is ours better? Are theirs better?" And we learn, but it's through a very inefficient way.

Senator BAUCUS. So you are saying that the EPA gorilla in the closet could be the gorilla that puts pressure on the States that are less efficient or more inefficient than the better States? Is that your point?

Mr. JORLING. Yes. There are some concerns in industry about the integrated permitting activity. I think they agree with it in concept, but they are concerned that they, like we, have limited resources. They may say, "What you are going to do is require 100 percent achievement in each of these areas in short time frames, and that will break our bank."

In fact, what we are doing in New York—I give an example of Kodak. Kodak is one of the largest chemical facilities in the world, located in Rochester. We now have 14 people full-time working on that facility alone. The objective is to work with the corporation, and say, "The corporation has a finite number of resources, and there are more obligations that the laws require to be implemented at that facility than those resources will admit." But with the corporation and with this task force we then say, "Here are the things that will provide the greatest environmental improvement, and we'll defer for some time period on those that, while legally required, are not going to produce a significant improvement in the environment." We then address their resources and our resources at those high-priority items. So we've given them the sense that, yes, we recognize that they have limited resources, and we want to work together with them to focus them on the most significant environmental improvements.

That then gives them a kind of comfort. But if the corporation beleives we will impose all of these requirements in one short time, they will resist this change. We must convince them that we'll be able to evaluate all the things that are necessary, and select only those that are the most necessary for a given permit period.

Senator BAUCUS. What grade would you give to the staff of EPA, overall?

Mr. JORLING. Qualitatively?

Senator BAUCUS. Qualitatively.

Mr. JORLING. A, without hesitation. The people are dedicated; they are competent; they are very much like the people I now lead at DEC. They are dedicated to improving the quality of life of all Americans. They are of very high quality. And they are as frustrated by some of these requirements as we are. The question is to break some of this inertia that has accumulated and encrusted over the system for the last 25 years.

Senator BAUCUS. Anybody else have anything to add?

Mr. TILT. I would just add very quickly—in Southern California, with the Gnatcatcher and the development pressures out there, there are some useful tips on this. Those parties are now sitting down at the table together, only after having beaten each other to a pulp and having spent millions and millions of dollars on lawyers' fees. And yet, even as innovative as that process may be in the California coastal sage arena, there are many on the outside who are still sitting there hoping it will fail, because——

Senator BAUCUS. Why?

Mr. TILT.—because the status quo does empower certain environmental groups. It empowers certain county and State officials to do their jobs the way they have always done them. And it is frightening that we would actually come to the table and have to make decisions that will affect land use over the next—it's a 25-year time frame for those developers, and yet it's only after the "Endangered Species of the Month Club" has beaten these folks to the table that they're willing to say, "Well, maybe we do need to try something different."

Senator BAUCUS. So you think that Spotted Owl/ Gnatcatcher approach that Secretary Babbitt is taking is a good one?

Mr. TILT. I think it offers to all the parties, the development interests and those who would preserve the biodiversity out there, a chance to sit down and make the larger picture decisions that are lacking, for instance, in the Spotted Owl.

Senator BAUCUS. I agree with you. I very much agree with you.

OK. This has been very helpful. Thank you very much. The hearing is adjourned.

[Whereupon, at 11:31 a.m., the committee adjourned, to reconvene at the call of the Chair.]

[Statements submitted for the record follow:]

STATEMENT OF HON. CAROL M. BROWNER, ADMINISTRATOR, U.S. ENVIRONMENTAL PROTECTION AGENCY

INTRODUCTION

Chairman Baucus, members of the committee, I am pleased to have this opportunity to discuss the United States Environmental Protection Agency's (EPA's) relations with State, tribal and local governments. As you recognize, it is these relationships that will make or break national environmental efforts.

Before coming to EPA, I headed Florida's Department of Environmental Regulation (DER) and worked closely with Florida's counties, cities, and water management districts. During my time at Florida DER, Hurricane Andrew hit south Florida, and I spent most of two months assisting Dade County in putting back together its environmental facilities and programs.

Florida DER often delegated Florida's regulatory authority to water management districts and local governments. We had two reasons for doing this: to take advantage of the expertise and human resources that local governments can put into the field to improve environmental protection; and, to reduce duplicative permitting. It was not unusual for Florida to adopt stricter environmental protection standards than EPA, and I often worked with local governments who wanted their State government to do more to protect Florida's environment.

My experience has taught me that State and local government officials often know the most effective ways to protect their own environments and that they are spirited in their efforts because they have a large personal stake in the results. I feel strongly that we cannot reach national environmental objectives until we acknowledge the value of, and support the building of, strong State and local capacity to manage environmental programs.

In earlier times, when the Federal Government was leading the charge to establish national environmental standards and providing most of the resources to do so,

States and local governments were content to allow EPA to call the shots, but lately they are questioning the Federal Government's parental approach. They are also questioning whether the Federal Government can determine the most appropriate environmental priorities for their communities or whether the Federal Government understands and recognizes unique State and local circumstances. They are insisting that we carefully evaluate the scientific basis of our regulations before we impose additional requirements. Some environmentalists are also wondering about priorities and whether duplicative efforts at the federal, State, and local levels are an unwise use of scarce resources.

I welcome this examination of federal, State, tribal, and local roles in environmental protection. I consider it a healthy sign that America's environmental protection is maturing beyond Federal Government implementation of valuable, but narrowly focused, regulatory programs, toward a new working relationship where environmental protection is a fundamental concern at all levels of government in the United States.

HISTORICAL-INSTITUTIONAL VEHICLES THAT EPA IS USING TO HELP PROMOTE BETTER EPA-STATE-TRIBAL-LOCAL-RELATIONS

EPA's relationship with its State-tribal-local partners is evolving. In the early 1970's, many national program responsibilities were administered by the Federal Government, although Federal financial assistance was provided to States through grants such as through Clean Water Act §§106 and 208. However, EPA increasingly became aware that success was dependent upon State involvement, and since the late 1970's, EPA has increasingly delegated its programs to the States. Accompanying this delegation, EPA has provided States with funding, training, guidance and technical assistance. We have also sought to improve and continue the evolvement of our intergovernmental relationship through information exchange and coordination. For example——

State-EPA Operations Committee

The State-EPA Operations Committee has met regularly since 1985 to discuss issues affecting management of environmental programs. This committee consists of ten State environmental directors (one from each of the regions), five representatives appointed by the Chair of the National Governors' Association's Committee on Natural Resources, two members representing State health and agricultural commissioners, two EPA Regional Administrators and the Administrator and Deputy Administrator of EPA.

This committee focuses on issues relating to State-managed EPA programs, and provides a good forum for senior officials to discuss problems face-to-face. I think that it is very important for everyone to remember that in many programs, through delegation or assumptions, States are the primary managers of EPA programs.

Local Dialog Group

In line with its evolving relationships, EPA is beginning to work more closely with local governments. For instance, in response to the growing concerns expressed by 200 State and local governments across the country, EPA has engaged in dialog meetings with local governments and the associations in Washington that represent them. From these exchanges, we have a pretty good idea what directions local governments would like the Federal Government to take. Local officials would like us to prioritize the implementation of environmental regulations based on environmental risk, to adopt regulations that are flexible enough to consider local conditions, to carefully analyze the scientific and cost-benefit bases of regulations before they are promulgated, to increase State and local involvement in the development of regulations, and to help with financing environmental services.

I want to clarify this last point. I do not believe that State and local governments' only concern is money. They certainly would like more funding to implement federal environmental mandates, but they recognize that financial times are tough. My understanding is they want representation and consideration in the national discussion of how funds, especially the States' own contributions to environmental protection, are spent.

To help build upon this dialog, I have suggested that EPA cosponsor a conference with the National Association of Counties on the relationship between EPA and local governments later this year.

Tribal Relations

Building sound environmental management programs in Indian Country is a major goal of the Agency. While the seriousness of these issues is apparent and progress has been made, much work remains to be done.

Historically, environmental protection has been based on a system of federal regulations with delegation to States for program implementation. However, States lack jurisdiction on Indian lands and cannot provide environmental management for these lands. Thus, EPA has the responsibility to provide for environmental protection on the 87,000 square miles of tribal reservation land in the U.S. To achieve this, EPA must provide either direct implementation or delegate program management responsibility to tribal governments.

In 1984, EPA issued an Indian Policy which commits the Agency to promoting Indian "self government" and working with tribes on a "government-to-government" basis. EPA is working to promote the development of inter-governmental relations, including federal, tribal, State and local cooperation, for the protection of human health and the environment. Recently, EPA began a Tribal Capacity Working group to discuss how to accelerate the progress made thus far toward building strong environmental management capacity within tribal governments. One of the main advances in this area was the passage last year of the Indian General Assistance Program Act of 1992. This Act provides permanent authorization for multimedia grants to Native American tribes to build tribal environmental management capacity. EPA efforts with tribes are focused on tribal capacity-building through the multi-media/general assistance grant program and implementation of specific media programs including regulatory and enforcement activities. Working with tribes on a government-to-government basis has led to tribal management of programs such as the water quality standards program by the Pueblo of Isleta and the pesticides program by the Three Affiliated Tribes of the Ft. Berthold Reservation; the creation of memoranda of understanding between federal, tribal, State and local entities; and the provision of a broad variety of technical assistance and training for tribal leaders and staff. As tribal governments continue to develop their infrastructure and capacity we look forward to their implementation and management of environmental programs including delegations and enforcement activities.

Office of Regional Operations and State and Local Relation:

EPA's Office of Regional Operations and State-Local Relations is a critical part of EPA's management system, and—working with program offices—it provides an important link between Headquarters, EPA Regions, States, localities and tribes. The Office serves as an important tool in managing and coordinating the needs of regions, States, local governments and tribes to build the capacity needed to manage our programs effectively. One of my priorities is to see that this Office has the resources and status it needs to effectively do the job of enhancing federal-State-local-tribal cooperation and coordination in this area.

RE-EXAMINING TRADITIONAL APPROACHES

As the nature of environmental protection has matured, the number of statutory mandates has increased, the site-specific nature of remaining problems has become more evident, and new problems have outstripped available dollars. EPA is realizing that it needs to re-examine even further its EPA-State-tribal-local framework. Emerging efforts in this regard can be seen through particular Agency activities.

The Task Force to Enhance State Capacity

Over the past year, EPA has had a task force working on a comprehensive review of EPA's approach to building State capacity to implement environmental laws. State delegations of Federal programs have increased from 309 programs in 1981 to 539 today. The task force is about to issue its final report. This task force is comprised of State environmental commissioners, and EPA regional and headquarters officials.

This Task Force has developed some excellent recommendations, including:

1. Making strong EPA-State relations a cornerstone of EPA's management policy—emphasizing flexibility, mutually supportive working relationships, and shared responsibility for environmental success. Enhancing State capacity should be a primary mission of the agency.

2. Restructuring program oversight practices to emphasize attainment of clearly identified environmental goals and accountability to the public for results.

3. More fully developing an environmental finance program at EPA which helps State and local governments develop alternative financing mechanisms for environmental programs.

4. Streamlining grant processes and advocating for multimedia grants.

5. Helping States use innovative approaches to improve their effectiveness, when these are consistent with environmental protection such as: general permits, administrative penalty authority, and tickets for minor violations.

6. Energizing EPA's environmental training program to increase participation of State and local employees.

7. Investing in information management systems that enhance information exchange between EPA and State and local governments, promoting access to the data, and ensuring data compatibility and quality.

8. Improving State and local scientific capability, through technology transfer and research assistance.

It is clear that these reforms would represent a significant change in the way that EPA does business. They represent a potential next step in the evolving federal-State-tribal-local partnership.

Local Government Outreach Program

Guide to Federal Environmental Requirements for Small Local Governments

Pursuant to a requirement in the Federal Facilities Compliance Act of 1992, EPA, building on some older regional guides, is nearing completion of a national "Guide to Federal Environmental Requirements for Small Governments." The purpose of the guide is to help local officials understand the major environmental requirements that affect their communities and to provide easy-to use listings of contacts so that local officials can get assistance and information. The guide will be updated annually.

Formal local government working group

We are currently considering developing an advisory committee under the Federal Advisory Committee Act to more formally continue our dialog with local officials regarding their capacity to implement environmental regulations. The Small Town Task Force required under the Federal! Facilities Compliance Act of 1992 could be organizationally a part of this advisory group.

Program-Specific Approaches to Working with State, Tribal, and Local Governments

In carrying out our statutory mandates we are constantly seeking to establish new and more effective partnerships with States, tribes, and local governments. Let me give you a few examples.

The Clean Water Act

The Clean Water Act and EPA's implementation of the Act recognize the importance of federal-State-tribal partnerships. Inherent in the law is the concept that States should have the primary responsibility for many programs, such as establishing water quality standards, identifying waters in need of protection, administering the National Pollutant Discharge Elimination System (NPDES) program once approved, and addressing nonpoint source problems through EPA-approved State nonpoint source programs. This partnership has been successful in addressing the traditional pollution problems facing the nation. Working with the States, EPA has awarded more than $57 billion dollars since 1972 to help localities build needed wastewater treatment plants, through a program that has been remarkably free of fraud or abuse.

However, remaining problems, such as wet weather water runoff, new requirements for stormwater discharge and municipal sludge, and needs we are now beginning to recognize such as ecosystem protection, combined with limited resources, have created tension. EPA is increasing its focus on watershed management, through programs such as the Great Lakes, Gulf of Mexico, Chesapeake Bay and National Estuary Program. Last week, EPA, other Federal agencies, and national and local organizations sponsored Watershed '93, a conference devoted to a joint examination of watershed activities. EPA has, based on State suggestions, developed guidance for States and Tribes on fish advisories and is sponsoring meetings to discuss options for controlling stormwater discharges. EPA is also assisting small and disadvantaged communities by helping them develop sound mechanisms for construction and operation of badly needed wastewater and drinking water treatment facilities. The President is also proposing additional funding for wastewater treatment in his economic stimulus package, as well as new funding for clean water and drinking water State Revolving Fund programs in the 1994 Budget.

The Safe Drinking Water Act

The impacts of the Safe Drinking Water Act regulations are a serious concern among State, tribal, and local governments, particularly small communities, and EPA has recently begun several efforts to help State and local governments. For example, EPA has made a special effort to involve State and local representatives in

the regulatory negotiations on the proposed disinfection byproducts rule. The Association of State Drinking Water Administrators, the National League of Cities, five organizations representing local public water suppliers, and the National Association of Regulatory Utility Commissioners have been serving on the committee which is negotiating the rule.

Six months ago, EPA formed a working group with five State representatives to identify problems in the implementation of several major drinking water regulations and the working group is making progress on recommendations to reduce the impact of these regulations on States and local governments. EPA is also working with representatives of Western States to help reduce the cost of the sulfate rule.

EPA's Ground Water Strategy, developed after a series of round table discussions with State officials, relies heavily on a federal-State partnership, and EPA's wellhead protection program offers considerable hands-on technical assistance to local programs.

The Clean Air Act

Effective implementation of the Clean Air Act requires building strong partnerships with State and local governments. The Office of Air and Radiation has successfully and regularly included State and local governments on workgroups, advisory committees and regulatory negotiations to obtain direct input in the development of rules before they are proposed, in strategic planning and in priority setting efforts. In addition, they have several hundred seminars, meetings and conference calls each year with State and local governments on a wide range of issues to better incorporate and address concerns on policies and rules.

Extensive training workshops and technical assistance programs are also given. For example, one part of OAR provides training to almost 3,000 State and local air pollution control officials a year at training centers around the nation. This will increase dramatically in the future, as a satellite downlink network has just been established in over 70 State/local agencies to provide training/seminars. Over 500 hours of training are planned for 1993 on the satellite system alone.

The Ozone Transport Commission is an excellent example of how EPA Headquarters and Regional Offices are working closely with States to more effectively address a difficult regional environmental problem. The Ozone Transport Commission is a regional group established under the Clean Air Act Amendments of 1990. It includes all States in the Northeast (including the Washington, D.C. metropolitan area) in a working partnership to solve pervasive air pollution problems caused or exacerbated by prevailing weather patterns. EPA Headquarters and Regions I, II, and III have worked extensively with the Commission to provide technical support (modelling) and policy guidance as the Commission grapples with the task before it.

Resource Conservation and Recovery Act (RCRA)

The hazardous waste program under RCRA has provided flexibility in its annual guidance for regions and States to set priorities and to address unique problems. In negotiating State grant agreements, States are able to substitute State priorities for national priorities if they describe the health or environmental benefits to be gained via the proposed activity. A number of innovative projects have been funded in this manner, including:

- a multi-media permit program in New Jersey that incorporates pollution prevention in a facility's water, air and hazardous waste permits;
- an effort that targets companies illegally handling hazardous wastes that threaten the Chesapeake Bay; and,
- a training and enforcement effort along the Mexican Border addressing cross-border waste management problems.

The municipal solid waste program under RCRA has provided valuable leadership and assistance to local governments in developing and implementing recycling programs. To address the growing need for markets for materials collected by local programs, EPA has supported the procurement of goods made with recycled content. In fact, EPA has issued five procurement guidelines that govern federal procurement decisions and serve as models for State and local governments. This direct market influence can be substantial since government purchases at all levels account for over twenty percent of the Gross Domestic Product. EPA also provides information, guidance and technical assistance to States and localities to assist them in planning and implementation efforts. This includes a series of how-to guides, a toll-free hotline, and direct on-site technical assistance.

The Federal Insecticide, Fungicide,and Rodenticide Act (FIFRA)

Effective administration of FIFRA and implementation of programs developed under FIFRA require attention to the needs of States, tribes and territories. Additionally, implementation of many provisions of FIFRA necessitate a coordinated fed-

eral-State Tribal-local partnership as many programs are delegated to the relevant lead agency.

Almost all States have been granted primary enforcement authority under FIFRA. This authority allows States to take "first response" actions in relation to FIFRA violations. Actions are reported to and coordinated with our Regional offices to enhance the effectiveness of our compliance programs. States are also granted the authority to conduct approved Certification programs for pesticide applicators who choose to make use of restricted use chemicals.

In the recent past, the States have forged new ground in helping to develop and implement programs to protect ground water and endangered species from pesticide exposures that may cause harm or unacceptable environmental degradation. These programs base pesticide management measures on the local conditions and allow the States the opportunity to develop the most appropriate measures. Because these are not traditional "command and control" programs, there are unique opportunities for the States and federal government to strengthen its existing partnership.

In addition to program specific relations with State and tribal governments, the Office of Pesticide Programs and the Association of American Pesticide Control Official have established a cooperative agreement under which the States coordinate State perspective input to the Agency on a variety of topics and disseminate critical information from the Agency throughout the country. Finally, in a mutually recognized need to continue to strengthen the federal/State partnership, States and EPA have supported training programs on a national basis to address program development and comprehensive program management, ground water protection, endangered species protection, and worker protection and pesticide disposal.

Improving Regulatory Flexibility

EPA's Office of Policy, Planning, and Evaluation and program offices are developing six pilot rulemakings where we will improve our analyses of compliance options for small businesses and local governments as required by the Regulatory Flexibility Act.

Multi-media Coordination

EPA has been struggling with how to best approach environmental concerns that cross media lines. The basic environmental statutes, which focus on a specific issue or media, have been the basis of the agency's organizational structure and have largely dictated its regulatory and policy approaches to solving environmental problems. Concerns such as ground water and habitat are not readily addressed by a single statute or office, but are broader issues that are affected by a multitude of programs and agencies. Lack of an integrated ecosystem approach has led to inconsistent or short-sighted decisions.

We need to attack these problems from several fronts. In developing major regulations that will clearly have broad impact, we are beginning to use a regulatory cluster approach. Teams of managers and staff from many offices work together to address an environmental problem in a holistic fashion. Top Agency management is involved in decision-making. Although we have used this approach in a limited number of areas to date, I see tremendous potential in this method to put individual regulatory actions into a broader context. The pulp and paper cluster is an example.

Our enforcement programs, too, have recognized the value of an integrated approach in assessing facility or plant overall compliance with environmental requirements. Working with the Regions and States, we have begun to approach inspections and follow-up enforcement actions from a multi-media perspective: looking at an entire facility or plant and evaluating how it meets environmental requirements across the board.

Regions, States and localities are ahead in their recognition of the need for a holistic approach. All 10 EPA regions have completed comparative risk assessments of the environmental problems they face, and have developed long-term strategic plans for addressing these problems.

Western Governors Association Memorandum of Understanding

In July 1991, a Memorandum of Understanding (MOU) was signed among DOD, DOI, DOE, EPA, and the Western Governor's Association (WGA) dealing with environmental restoration and waste management issues shared by States, commercial entities, and the federal government. The purpose of the MOU is to establish a cooperative approach to the development of technical solutions to environmental problems. To implement the MOU the Federal agencies and WGA have examined issues such as workforce planning, technology needs, regulatory barriers and technology development. The Federal agencies and WGA are working to establish and implement technology demonstration projects.

Regional Activities

EPA's regions are key to promoting State, tribal, and local participation and capacity. It is the regions that on a day-to-day basis carry on the critical interactions with States, tribes, and localities that produce environmental successes. I will mention just a few examples of special activities the regions have been undertaking recently.

Region 9 is currently assisting its States to conduct comparative risk projects to identify important environmental problems and develop common strategies. After six years of effort, Region 9 also recently transferred lead responsibility for the RCRA hazardous waste program to California, making California the last major industrial State to receive authorization for this program. Region 7 has, jointly with the State of Missouri, prepared an environmental regulation handbook for small communities, has provided a great deal of training to State officials, and has conducted a voluntary emissions reduction program with industry, State, and local officials. In the Northwest, Region 10 has underway a sustainable development initiative in cooperation with the State of Idaho, local governments and private industry.

Region 5 recently negotiated a Superfund Memorandum of Agreement for five of its six States, which clarifies the roles of the region and the State in Superfund activities and provides a dispute resolution procedures. Region 8 has recently entered into an agreement with the States of Colorado to give the State more flexibility in using its EPA grants for State priorities, had conducted training programs for States based on a survey of the States' most serious needs, and has conducted continuing meetings with State directors to promote communication.

CONCLUSION

With your help, we will establish as one of EPA's primary missions the building of a national environmental partnership with the States, tribes, and local governments. States, tribal and local governments feel overwhelmed by the breadth, complexity and cost of existing environmental needs, mandates and expectations, and must get some relief. If States, tribes, and local governments fail in their environmental management efforts, and they *are* in danger of failing, then EPA fails.

We need your support in order to effectively prioritize our environmental protection efforts. But let me emphasize that when I talk about prioritization and flexibility, I am not promoting less environmental protection. Instead, I am seeking better protection. Prioritization increases environmental protection by focusing our resources. We should all be working on what good science and State and local officials on the front lines say makes a difference—good science and good rapport. Responsible stewardship of the nation's environmental agenda requires exercising the utmost leadership in bring together the best of Federal efforts and State, tribal, and local efforts.

In this vein, EPA could also use the help of Congress in assuring that Federal laws do not inadvertently create barriers to State, tribal, and local participation in the regulatory and administrative process. I hope that we can consider these issues as the various re-authorizations are brought forth to the Congress.

In closing, I congratulate Chairman Baucus an all of the committee members for identifying this crucial issue and highlighting it with a hearing. I also thank you for inviting me to testify on a subject near to my heart. I hope that by my testifying here about EPA's State-local-tribal relationships, we be stimulated to work harder at building an effective collaborative system.

In this I ask you to assist EPA in not only improving EPA and State, tribal, and local government relations, but in reinventing environmental protection as a critical endeavor in which States and local governments are equal partners. The nation's environmental deserves nothing less.

STATEMENT OF TOM UDALL, ATTORNEY GENERAL, STATE OF NEW MEXICO

Senator Baucus and members of the committee:

I am Tom Udall, Attorney General of New Mexico. I am testifying today as Vice Chair of the Environment and Energy Committee of the National Association of Attorneys General and as Chair of its Environment Legislative Subcommittee. Thirty-three Attorneys General serve on the Environment and Energy Committee, which shows just how important an issue the environment is for the states.

My comments today will address both general issues relating to the relationship between the state and Federal Governments vis-a-vis the environment and specific issues relating to environmental enforcement by states and the EPA. Attorneys

General, as the states' chief law enforcement officers, are most directly involved with the enforcement side of environmental regulation. I also have a number of suggestions to strengthen the state-Federal partnership, which is so important in these times of shared programs and management, and shrinking resources to pay for enforcement.

Before getting on to my specific recommendations, let me first briefly summarize the role of the state Attorney General in the implementation and enforcement of environmental laws. This varies quite a bit from state to state. In my state of New Mexico, most environmental agencies have their own in-house attorneys who do the day-to-day work of the agency, including administrative and some civil enforcement actions. All civil enforcement litigation is handled either by my office or by the agency in-house counsel under my commission. Like many other Attorneys General, my office has a criminal environmental enforcement program. In most other states, the Attorney General represents all environmental regulatory agencies in civil environmental enforcement actions. In addition, the state Attorney General may provide legal counsel to state environmental agencies and/or decision-making bodies for daily operations, rulemaking, and administrative adjudications. The Attorney General typically also represents state agencies named as defendants in environmental actions.

As you are well aware, nearly all of the Federal environmental laws establish a Federal-state partnership, the implementation of which relies largely on regulation by state agencies and enforcement by state Attorneys General. Although states initiate the majority of environmental enforcement actions, EPA maintains an oversight role. EPA can "overfile" (that is, file a second Federal enforcement action) if it believes that the state enforcement action is not sufficiently strong. EPA can also theoretically withdraw its authorization of a state environmental program, based on a consistent poor performance. EPA has only very rarely exercised this authority.

A number of changes have occurred over the last decade which bear on the state-Federal environmental relationship and how that relationship could or should be altered. These changes include (1) the large increase in the number of regulated entities (primarily small quantity hazardous waste and pollution generators such as dry cleaners, underground storage tanks, medical waste producers, mobile sources of air emissions, etc.), without a concurrent increase in Federal funds to help states regulate these entities; (2) the failure of the most heavily Federalized programs, such as RCPA and CERCLA, to do what they were intended to do (e.g., very few cleanups have been completed under CERCLA, yet states were not given a role under CERCLA to step in where EPA has failed to act); (3) new international and interstate environmental problems that require EPA attention (e. g., biodiversity, acid rain, the ozone hole); (4) the gradual realization that many thousands of Federal facilities around the country are heavily contaminated and include some of the most hazardous sites known (e.g., 5,000 of the 27,000 installations owned by the Federal Government have documented environmental contamination, and EPA expects that this number may double in the next five years); (5) planning and proposed construction and operation of large Federal nuclear waste facilities at WIPP and Yucca Mountain; (6) growth in the ability of state programs to handle more complex and larger environmental programs (e. g., RCPA permitting delegation and Clean Air Act Amendments authorization); and (7) greater political support behind environmental programs at the state level.

The message that we must take from all this is not just that neither the Federal Government nor the state government by itself has the time or resources to bring about adequate environmental protection. We have all known that for a long time. Rather, we must learn from this rich array of experience how to design more effective and more streamlined coordinated state-Federal environmental programs. We have now a new Administration with a unique perspective on both the state and Federal sides of the coin. And we have learned a great deal from our experiences with a variety of statutory state-Federal arrangements over the past two or three decades. It is therefore an ideal time to reexamine what works and what doesn't in the relationship between EPA and the states and to establish a new and better model for the future.

Along those lines, on behalf of the state Attorneys General I offer the following specific suggestions aimed at improving the state-Federal environmental relationship:

1. *Greater State Involvement In Promulgating Environmental Rules and Regulations*

The states and the Federal Government are joint partners with respect to the environmental regulatory schemes. Therefore, states need to be given a greater role in developing environmental regulations particularly regulations which rely upon

state implementation and enforcement. States should be treated as coregulators rather than being relegated to the same role as members of the public in the rulemaking process. Early and substantial state involvement in the rulemaking process will avoid problems further down the road.

2. *Improved State-Federal Enforcement Coordination*

One of the keys to more effective state-Federal environmental programs is improved coordination and cooperation in enforcement. We suggest here at least two steps that we believe would help effect the needed improvement.

(a) *State-Federal-Local Conference*

A joint state-Federal effort focussed on strategic planning and on development of new coordinated enforcement strategies could be kicked off through a high level conference bringing together EPA and other appropriate Federal officials, Attorneys General and state regulators, and local officials, with the formation of work groups of the principals to report back within a six month time frame.

This approach could be implemented through a revitalized National Environmental Enforcement Council (NEEC), an entity which brings together the top enforcement personnel at EPA, DOJ and other agencies, Attorneys General, district attorneys, U.S. Attorneys, and state agency heads. NEEC, on which I serve and of which Massachusetts Attorney General Scott Harshbarger is vice chair, would be an excellent vehicle to work through this process.

(b) *Better Communication Between EPA Regions, States, and Local Officials*

We need improved and closer relationships between state enforcement personnel and EPA regions. EPA should encourage its regions to work more closely with the states to develop joint enforcement strategies.

Communication should particularly be improved in the criminal enforcement area between Federal officials (EPA and FBI) and state and local officials. Approximately 35 Attorneys General have some form of criminal jurisdiction. In some states criminal enforcement is a local function. Whereas on the civil side state enforcement primacy is well-established, on the much newer criminal side the boundaries of authority between EPA and the states are not well defined. Too often, state or local officials will be pursuing a criminal case at the same time that Federal officials are doing the same, with little coordination. We recommend that Federal officials establish and work with Law Enforcement Coordinating Committees to promote coordination and inter-agency assistance in the criminal area.

3. *Improved Enforcement Training*

Good training for state and local environmental enforcement personnel is of the utmost importance. EPA's assistance in this area is essential. The National Enforcement Training Institute (NETI), which Congress approved in the Pollution Prosecution Act of 1990, sponsored by Senator Joe Lieberman, is an excellent approach to this problem, but it lacks adequate funding. Training will yield results, and the states cannot perform this function alone. Funding sufficient to operate NETI and make training available to state personnel should be provided.

4. *Greater EPA Flexibility*

EPA needs greater flexibility in the way it regulates state programs. Results appear to be measured by "bean-counting" by different media-specific programs rather than taking a more holistic approach that looks at overall impact and results and that takes into account the wide variations in state programs and problems. As it stands now, whenever a state wishes to innovate and be creative about an environmental problem, EPA seems to stand in its way rather than supporting the states' initiatives.

5. *Increased Federal Technical Support*

The Federal Government needs to do a better job of helping states with technical support. We need to work out better ways of sharing technology so that we can keep our costs down. Much information is collected but it is presently inaccessible to states. More priority on the collection of environmental data and getting it to the states would be of great benefit to the states for their enforcement targeting. Further, states with active criminal environmental enforcement programs find it difficult to obtain lab assistance for sampling and analysis. Traditional crime labs and health labs may not have the necessary testing capacity or necessary familiarity with criminal procedure. EPA should be encouraged to build with the states on a regional basis such a technical support capacity.

6. *Direct Funding*

Direct funding to Attorneys General for enforcement of environmental statutes should be provided, especially to encourage innovative programs. Pass through via state environmental agencies is not always adequate and much time is spent on negotiating arrangements between agencies and Attorneys General. This obviously detracts from the purpose and effect of Federal funding for state environmental en-

forcement. EPA should establish a mechanism for resolving or avoiding these disputes and allowing direct funding, which in turn will free up more funds for the purpose for which they were intended.

7. *Federal Facilities*

EPA should take the lead role on interagency environmental issues, many of which arise in the context of Federal facilities. To that end, EPA may need to be granted greater authority so that in the case of interagency disputes it can be the decision maker and chief enforcer. This enhanced role for EPA would also improve Federal-state relations, as states will have ongoing contact with their EPA regions on all environmental issues of common concern. We have worked well with Tad McCall and EPA's Federal facilities office, and we look forward to EPA's strong focus on compliance by its sister Federal agencies.

(a) *Cleanup*

Federal facilities cleanup needs to remain a top priority for EPA and the Federal Government. For 50 years, states asked what was going on at DOD and DOE facilities and for 50 years, states were told to mind their own business. Now, we all have to deal with the mess that resulted from that narrow-minded approach. At one DOE facility in New Mexico, for example, there are nearly 2000 hazardous or potentially hazardous and radioactive waste sites. Over 200 of those sites contain radioactive materials. There is somewhere around 200 pounds of plutonium lying around in various sites at that single facility, none of it stored properly. DOE, acting under' EPA oversight, estimates that it will take twenty years and $2 billion to clean up these sites. Only recently has the state been permitted any oversight of this and other Federal facilities in New Mexico.

NAAG worked hard for the passage of the Federal Facilities Compliance Act, and we commend Chairman Baucus, Senator Mitchell, and the committee for passage of the Act. That is only one piece of the puzzle, however. The vast majority of the work lies ahead for EPA, the other involved Federal agencies, and the states.

(b) *Base Closures*

EPA also needs to take certain steps relating to base closures, another issue important to states. For example, there are several different versions of the definition of indemnification. We need clarification and closure as quickly as possible on questions such as the scope of the Community Environmental Response Facilitation Act (CERFA). Does it apply to all Federal property or only to property being disposed of under laws similar to CERFA? What is the state's role in evaluating NPL site? Will the states at least be consulted, even though this is not required?

Conclusion

In conclusion, I would like to say a few words to Ms. Browner. We are very pleased that President Clinton appointed you. There are tremendous challenges awaiting you and all of us charged with enforcement of our country's environmental laws and the protection of the health and safety of our citizens. We have high hopes that your previous experience on the state side of things will move EPA quickly along the road toward an improved state-Federal environmental relationship. And we ask for you to remember the state viewpoint as you develop EPA's rulemaking and national enforcement strategy. We look forward to working with you.

And Mr. Chairman, thank you for giving me the opportunity to testify today about the state-Federal relationship. At this time of new beginnings and new directions, it is very constructive to have this dialog. Thank you for holding this hearing.

STATEMENT OF THOMAS C. JORLING, COMMISSIONER, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

It is a pleasure to be here before you as you examine perhaps the most important structural element in the Nation's Environmental Protection Laws: the Federal/State Relationship.

While I will speak to issues that exist in the current Federal/State Relationship and make recommendations, I think it important to state at the outset that it is the genius, the creativity, the flexibility, and the comprehensiveness of the Federal/State Relationship that has enabled this Nation to make more progress in environmental protection than any other Nation in the world. My perspective on this is one that has been honed:

By the experience of six years now as Governor Cuomo's Commissioner of New York State's Department of Environmental Conservation;

By many years as a student and professor of Environmental Protection in academia;

By three years as an Assistant Administrator at the U.S. Environmental Protection Agency, and

By my service as you know, Mr. Chairman, as minority counsel to this committee under such giants as my boss, Senator John Sherman Cooper; the ranking minority member, Senator Edmund Muskie; Chairman of the subcommittee on Air and Water Pollution, J. Caleb Boggs; Howard Baker; Jennings Randolph; Tom Eagleton and all the other members. These individuals legislated where none had gone before. While it was through their foresight that the Federal-State Relationship took such prominence in our environmental laws, it is through your foresight and that of your colleagues that this relationship is now being examined and, hopefully, refined and strengthened to meet the environmental challenges of today. Mr. Chairman, may I be so bold as to suggest that the history of bipartisanship in this committee, a tradition I know of from personal experience, has been a significant factor in the shaping of our environmental tradition. I commend you, Senator Chafee, and all your colleagues for what I know is your intention to carry forward this spirit of bipartisanship.

Mr. Chairman, under the Federal/State Relationship, responsibility for the administration of our environmental control laws is divided between the U.S. Environmental Protection Agency and the States. The relationship is as extensive as it is complex, and cannot be described simplistically. It is important to provide a frame of reference by identifying how these primary responsibilities are allocated. The role of the Federal Government includes:

Setting minimum National standards relating to health, performance and availability of technology;

Assuring that these minimum National standards are applied and complied with evenly across the States to assure a level playing field;

Serving as the Environmental Steward to convince State legislatures and the regulated community of the steadfastness, integrity and universal applicability of the National program;

Delegating programs to qualifying states and monitoring compliance with the delegation;

Implementing programs in non-delegated States;

Providing funding to enable the states to carry out the Nationally mandated programs; and conducting research and program development on National Environmental issues, especially health issues and technology assessments.

The basic mission and duty of the states, which are declared by the statutes as having primacy, is the implementation of the programs. This means the actual facility-by-facility and source-by-source permitting, compliance monitoring, and enforcement of regulatory programs. This same authority is accompanied by inherent state authority to establish any requirements more stringent than Federal law requires.

But like any program which is sound in concept, execution has not always been smooth:

The Delegation Process: This linchpin of the Federal-State Relationship does not always operate to promote specialization by state and Federal regulators in their respective spheres. In theory, when delegation is awarded to a State, EPA should pull back and devote its attention to less mature state programs. In practice, EPA often attempts to retain control, second-guessing the permitting and enforcement decisions of the delegated state.

Unfunded Mandates: The Federal-State Relationship thrived in the early years of the environmental movement because the allocation of responsibility to State Governments was accompanied by adequate funding. Beginning in the 1980's, annual appropriations began falling well below the level that had been authorized at the time the program was created.

Duplication of Effort: There has been a tendency to create unnecessary and duplicative roles for EPA in areas where the states have developed superior expertise, such as in Solid Waste Management. Federal funding and staffing have been insufficient where services are beyond the capabilities of the individual states, where an aggressive Federal role is clearly justified.

Adaptation and Innovation: For all the flexibility and maturity that it has acquired over the years, in recent times the Federal-State Relationship has become sluggish in adapting to innovation. Perhaps it is the size and complexity of the EPA, or the lines along which it is organized, or perhaps even ii' is the structure of the laws which it administers. Whatever the reason, innovation in state programming has been impeded in recent times, particularly in multi-media programming about which I will have more to say presently.

Delegation: The Evolution of the Federal-State Relationship through the delegation process is evident in the Water Pollution, Air Pollution, RCRA Hazardous

Waste and Safe Drinking Water Act programs. Parallel developments have not occurred in TSCA, Superfund or the FIFRA programs. I urge the committee to review these programs to determine if, as I believe, a more characteristic Federal/State program should be established.

The existing calls for a complete overhaul of the Superfund program are, I think, misguided: the laggard pace of site cleanups can be improved with certain enforcement changes and, more importantly, by turning the program over to any state which has demonstrated the ability to proceed just as effectively and more quickly than the Federal Government.

Greater state involvement in the wetlands program should be encouraged and facilitated by Congress. States are better able to provide regulatory services and resource protection, closer to home. Greater use of state program general permits would allow states to negotiate a level of oversight and coordination appropriate for their respective programs. Congress should also encourage greater involvement by local governments in wetlands protection.

This after all is the essence of delegation: capitalizing on the superior expertise of the individual states and freeing up the time, resources and attention of EPA staff for the states which most need the help. Unfortunately, in those programs where there is already a delegation component, it does not always operate to achieve maximum economy.

New York is a delegated State for portions of the RCRA C Program. Despite our status, EPA's staff continue to conduct facility inspections and initiate enforcement actions based on those inspections, even when it is clear that EPA cannot match the state in its ability to quickly deploy front-line personnel in response to serious violations where the potential for further environmental degradation is apparent. In a very serious case that is still underway, the fact of continuing environmental violations at a major New York facility was uncovered in a 1987 audit; it took EPA until 1992 to initiate the enforcement action.

Where the state is given the lead role for enforcement, regional staff sometimes attempt to micro-manage the case, pressuring for expeditious resolution and second-guessing the decisions of our personnel. Mr. Chairman, I am submitting for the record a copy of my department's third annual enforcement report which I think speaks for itself as to our enforcement capabilities. Certainly it demonstrates that EPA's refusal to delegate all cases where the state has statutory jurisdiction, or to insist on residual control over cases it does delegate, is a relationship appropriate only to less advanced state programs and not to an aggressive program like New York's.

Finally, the dictates accompanying our funding do not always reflect our priorities as we define them. In New York, regulation of toxicity characteristic wastes - which have not been officially defined as hazardous wastes in New York -consumes inordinate staff time and resources. We are not allowed to spend our Federal grant on a more pressing need for the state: the closeout of facilities to accommodate economic redevelopment.

New York is not a delegated state for the pretreatment program, but we share responsibility with EPA and, in fact, we provide more resources to that effort than the EPA region. Neither agency has enough funding to carry out the program as intended, and we cannot accept delegation knowing that we will be expected to increase our efforts dramatically.

As Congress considers adding delegation components to programs which do not now have them—and as our new EPA Administrator reviews the internal processes and procedures of the agency—the view must be toward restoring the fundamental goals of the delegation process: to achieve economies in time and resources by allowing states to stand in the regulatory and enforcement shoes of the EPA wherever and whenever possible. The delegation relationship must be tailored to the maturity and sophistication of each individual state program, with no excessive oversight when none is called for. And most importantly, although a list of program eligibilities should be established, states should be authorized to allocate funding within those eligibilities according to state-ordered priorities.

Funding: Today's environmental statutes are replete with examples of unfunded and under-funded mandates. They include the nonpoint source, stormwater, pretreatment, and safe drinking water act programs. Happily, there is growing recognition within congress and the Federal bureaucracy that states can no longer absorb the loss of Federal dollars and maintain programs and services at previous levels or accept new programs. There is a new "pay-as-you-go" mentality which the states applaud, and as the search begins for new revenue streams, New York would emphatically suggest the following:

Make the most of established funding mechanisms which stretch scarce State and Federal dollars and impose discipline on the environmental services they fund. The example that comes to mind is the highly successful State Revolving Loan Fund program (SRF) which allows states to leverage the Federal funds they receive to generate, in New York's case, up to three dollars of funding for every dollar invested. It now appears that the SRF program will be extended through 1997; and that additional funding will be added to allow expansion of the program to include drinking water projects. Congress should consider additional expansions to reach all environmental infrastructure needs. Most important, the impulse to return to the antiquated system of grant funding should be resisted as a wasteful expenditure of scarce Federal funds.

Be creative in identifying new sources of environmental revenues. A prudent environmental fiscal policy would include multi-media emissions fees which further the fledgling multimedia programs of several states and which would generate significant revenues to support these and other services. On a smaller but no less creative scale, a National returnable container act with mandatory recapture of unclaimed deposits could generate hundreds of millions of dollars to support state environmental programs. No potential source of revenue should be overlooked, but we caution that congress must give maximum flexibility to the states to collect and allocate these revenues according to their self-established priorities, and that congress must not interfere with state revenue-raising activities in the creation of new Federal fees.

Finally, as new programs are created through the legislative process, Congress must be mindful that the development of superior state expertise in many areas of environmental programming is a natural and desirable consequence of the evolving relationship between states and the Federal Government. This committee is to be commended for rejecting proposals in last year's RCRA reauthorization that would have required EPA to rigorously review state solid waste management plans, and substitute the judgment of Federal regulators for those of the states with a long history of state primacy in this program.

In the same bill, this committee correctly placed more emphasis on EPA's role in the Solid Waste Management activities which are beyond the capabilities of the states, such as technology development and creation of markets for products recycled under State-Managed programs. This should be the thrust of all future environmental legislation. Revenues created to support new programs should be allocated to states for the services they are best equipped to deliver; remaining revenues should be directed to EPA, with an emphasis on research and development and regulating only where states have not done so.

Multi-Media Programming: The trend toward Multi-Media Programming will significantly alter the Federal-State Relationship, for the better. More states are shifting programmatically to multimedia, pollution prevention permitting, inspection and enforcement. This holistic approach discourages industry from switching emissions/discharge strategies from one medium to another and encourages pollution prevention. Combined permitting eases disruption to the regulated community and is a more efficient use of shrinking governmental resources. It creates more leverage in enforcement negotiations for governments to take a holistic approach.

Yet, the degree of Federal support for and involvement in state Multi-Media Programs has been mixed. Many states which are taking bold steps in integrating multi-media pollution prevention into their programs have indicated that flexibility on the part of EPA is critical to the success of their programs; that such flexibility and commitment to real pollution prevention programs varies from one EPA region to another; and that while EPA often pays lip service to the concept, its support evaporates when program-specific grant moneys are at stake and "bean counting" required by law or regulations may be compromised by the flexibility needed to achieve real pollution prevention.

In enforcement, EPA headquarters has attempted to encourage multi-media approaches by addressing the issue in memoranda on Federal-State Relationships. But the regional offices are less enthusiastic. Multi-media enforcement cases are resource-intensive; they take longer to develop; and they do not fit neatly into established regional procedures for environmental enforcement. In one case, in the midst of a comprehensive multi-media enforcement action against a major chemical facility, EPA issued a notice against the facility of a single violation under the emergency planning and community right-to-know act, a program under which the state has no direct state jurisdiction. There was no attempt by EPA staff to incorporate its violation into the state enforcement action. At risk was the higher penalty the state was seeking but, more important, we risked losing the pollution prevention initiatives we planned,including environmental audits and facility upgrades. In the end,

we were able to salvage our case and, since then, we have attempted to get EPA concurrence on incorporating their enforcement actions into ongoing state efforts.

The most important contribution to multi-media programming that congress could make would be to amend the clean air act, clean water act, RCRA, superfund, and TSCA, to harmonize the substantive and procedural requirements of those statutes for use in state multi-media programs. These amendments must also explicitly authorize states to use at least 50 percent of their program-specific funds in multi-media activities. I am attaching such a proposed amendment for the hearing record and would urge that the committee give it every possible consideration.

Congress must also change the way it measures the progress of the agency in meeting its statutory goals and mandates. In enforcement, accomplishments can no longer be measured by the number of enforcement cases concluded in a given year. In the case I just mentioned, one multi-media action probably resulted in more future pollution reduction than ten separate cases which did not impose multi-media, pollution prevention requirements upon the violator.

EPA can also help to clear the path for Multi-Media Programs by:

Deemphasizing "bean counting" in awarding program-specific grants. Where specific numerical goals cannot be avoided, the agency should be more realistic in calculating its pricing factors and the regions should consult in advance with the states before the numerical goals are established;

To the extent allowed by law, setting aside a continuous and stable funding source for state Multi-Media programs. EPA should also combine the various sources of revenue now available for those programs, and allocate them to states to address their "major obligations" as determined by the states based on risk. This is similar to our new approach in New York state where we are attempting to target a substantial number of our resources to regulating the major toxic dischargers who generally represent the higher risk facilities; and

Working with the National Governors' Association, Associations of State Environmental Managers and other Groups, to Solicit Ideas for Assisting and Encouraging State Multi-Media Programs.

State Clean Car Programs: I cannot close without commenting on the events now unfolding in the New York state legislature, and related Federal court developments, on the future of New York's clean car program. While not directly related to the subject of this hearing, it is an example of the need for a close Federal-State partnership.

As you know, Mr. Chairman, our efforts in New York State to adopt the California clean car program are under assault. There has been an adverse Federal district court ruling that New York cannot adopt the California Low Emission Vehicle Program (LEV) unless it also adopts California's Clean Fuels Program. And the New York state legislature is showing signs that it will not vote the funds necessary to proceed with adoption of the California standards. In fact, a bill divesting my department of its authority to adopt emission standards for the 1993 and 1994 model years has passed the New York State Senate; a similar measure has been introduced in the state assembly.

Few environmental laws so aptly demonstrate the division of responsibility between the Federal and State Governments than the Clean Air Act amendments of 1990. For in that law, congress assigned to the states the ultimate responsibility for meeting clean air standards and equipped them with certain essential statutory authorities and access to new sources of revenue. Congress reserved to EPA an oversight role and last-resort regulatory and enforcement authority where states fail to live up to their obligations.

New York State has analyzed its current emission loadings and found that the automobile is the single largest source of ozone precursors and, along with carbon monoxide, a significant contributor to our toxic load. Our strategy for complying with the Federal mandates inevitably relies heavily on reducing auto emissions, a strategy which is by far more cost-effective than adding additional controls to stationary sources.

Those of us waging the Clean Car Battle in Albany, as well as the other States of the ozone transport commission, see a compelling overriding Federal interest in the future of the New York programs for it is only one of many programs across the country for which attainment may require adoption of the California standards. This is a test of whether the tools which congress intended to give to States will in fact remain available to them in designing and implementing their clean air programs. And this is a test of whether EPA will serve as the Environmental Steward, communicating to State legislatures and the regulated community the steadfastness and integrity of the Federal Clean Air Program.

Governor Cuomo and I have requested that EPA file a clear statement of policy to support our legal position to reverse the lower court ruling. The department is also seeking a clear signal from EPA to assist us in the debate now raging in our legislature, where some leaders have been publicly quoted as expressing skepticism that the agency will impose sanctions if a State fails to meet it clear air mandates. We believe both actions would be an effective exercise of EPA's responsibilities which you so clearly established in the Clean Air Act.

This concludes my prepared statement. I will be happy to answer and questions you or your colleagues may have.

STATEMENT OF THOMAS C. JORLING, COMMISSIONER, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ADDENDUM SUBMITTED FOR THE HEARING RECORD

Wastewater Treatment Grant for Boston Harbor Cleanup

Mr. Chairman, New York State strongly opposes the $100 million wastewater treatment grant which the Commonwealth of Massachusetts and the Massachusetts Water Resources Authority are seeking in the FY 1994 EPA budget.

We strongly oppose rewarding the recalcitrance of a major metropolitan sewer district which allowed more than a decade of 75 percent and 55 percent Federal matching grants to pass by without dedicating funds to improve the infrastructure serving more than 43 cities and towns, including Boston. Over this ten year period while the Authority and its predecessor, the Massachusetts District Commission, maneuvered to avoid their legal responsibilities, the cost of the solution increased dramatically through inflation and the cumulative effects of massive deposits of wastewater and untreated sludge into Boston Harbor. All this occurred while cities and towns in other states throughout the Nation were proceeding to build primary and secondary treatment capacity using Federal grants supplemented by their own funds. Rates paid by those in the greater Boston service area were dramatically lower than those paid by complying communities. The environment suffered and other cities were at a competitive disadvantage during this period.

The Authority reluctantly acted only under the pressure of Federal and citizen lawsuits and the aggressive actions of EPA's Regional Administrator. It has been slow in starting up its State Revolving Fund program and has lagged behind most other states, including New York, which, since the inception of the SRF program, has issued $1.2 billion in low-interest loans for community wastewater treatment projects. Interestingly, preferential grant funding is being sought at the expense of other states even though the Commonwealth of Massachusetts has statutorily capped the amount that its SRF will devote to the Boston Harbor cleanup at 50 percent of its annual SRF activity.

Mr. Chairman, during all the years of the construction grants program, those of us who followed the law put up substantial state and local matching moneys (since 1984, 45 percent of each grant) to pay for the cost of meeting the secondary treatment ruirements of the Clean Water Act. The Authority seeks now to not only have the Federal Government blink at its years of non-compliance but to be rewarded for doing so by special bailout, and one that would operate at the expense of those who did comply on a timely basis.

Our system of environmental protection laws cannot maintain its integrity and respect if those who are the most recalcitrant are given special privilege. The crisis in Boston did not result from a good faith effort to comply. The Authority proposes now that the solution to the current crisis—which is a crisis of its own making—should come at the expense of other states whose future SRF appropriations will be reduced in order to accommodate the Boston Harbor bailout. The Committee should reject this request for preferential treatment and instead require the needed funding to come from State grants and loans.

STATEMENT OF THOMAS C. JORLING, COMMISSIONER, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION ON THE NORTH AMERICAN FREE TRADE AGREEMENT

INTRODUCTION

This is an assessment of the North American Free Trade Agreement's (NAFTA) potential impact on New York's environmental laws. Essentially, although the final version of NAFTA contains provisions protecting each nation's right to have high

environmental product standards, there may be challenges to state product standards which are higher than Federal standards. To correct this problem, implementing legislation or side-bar agreements should:

(1) grandfather existing stricter state requirements;

(2) mandate state participation in the activities of the committee on Standards-Related Measures and its subgroups;

(3) require the Federal Government to allow states to defend stricter state standards in NAFTA proceedings;

(4) require the Federal Government to pay state costs for these appearances;

(5) open the dispute resolution process to the public and require the participation of environmental experts when environmental laws are challenged; and

(6) establish a Trilateral Commission and provide adequate funding for enforcement and environmental infrastructure.

From a purely New York State perspective, the key issue is whether our stricter State environmental standards can be overridden by Canada or Mexico in their efforts to reduce trade barriers through international and national harmonization of standards.

BACKGROUND AND HISTORY

NAFTA is a 2,000 page draft international agreement that attempts to lower both technical (product standards) and non-technical (tariffs) barriers to international trade. It covers market access, trade rules, services, investment, intellectual property and trade remedies. It is similar to the General Agreement on Tariff and Trade (GAff), a longstanding trade agreement signed by more than 100 nations. However, the NAFTA parties consist only of the United States, Canada and Mexico. Other countries may eventually sign on to the Agreement.

In May 1991 Congress gave the President "fast track authority" for agreements signed by May 31, 1993. Congress agreed to fast track implementing legislation (no amendments, deadlines) as long as the President consults closely with Congress on the negotiations. In granting fast-track authority, Congress underscored the importance of including topics new to trade agreements—environmental standards, health and safety standards and workers' rights. As a result, NAFTA contains provisions governing these areas, and our issue is whether the environmental provisions protect more stringent state laws.

I note that President Clinton's position on NAFTA is that it should be approved and not renegotiated, but, also, that identified shortcomings concerning environmental requirements and labor standards must be resolved through side-bar agreements. Consequently, any suggestions made below should be incorporated into Federal implementing legislation or international side-bar agreements.

I will focus here primarily on the issue that I, because of my responsibility for state environmental requirements, can best address and that needs to be addressed—the potential impact of NAFTA on state environmental requirements that are stricter than Federal environmental standards. The major problem I foresee is our inability to defend state requirements or to ensure that the Federal Government defends them for us.

ENVIRONMENTAL STANDARDS

The most significant environmental standard issue raised by NAFTA from the Department of Environmental Conservation's (DEC) perspective concerns the setting of product standards within the United States based on environmental considerations. I am particularly concerned about instances where New York State standards are stricter than Federal standards, e.g., New York State currently requires development of the less polluting California car rather than the Federal car (6 NYCRR 618).

Two segments of NAFTA affect product standards established for health and environmental reasons. The first concerns the "Sanitary and Phytosanitary Measures" (S&P) found in Chapter 7 (Agriculture), Subchapter B. Sanitary measures relate to humans and animals, while phytosanitary measures relate to plants. The second segment concerns "Standards-Related Measures" (Chapter 9), and covers any standards-related measure not covered by the S&P measures. Examples include requirements on packaging that limit or prohibit the use of certain materials for environmental reasons or restrictions on architectural coatings that limit the amounts of ozone precursors. DEC is most concerned with these latter Standards-Related Measures.

Under Article 905.1, international standards are to be used as a starting point except where this would be ineffective or inappropriate (this process is known as "harmonization"):

> Each Party shall use, as a basis for its standards-related measures, international standards whose completion is imminent, except where such standards would be an ineffective or inappropriate means to fulfill its legitimate objectives, for example because of fundamental climatic, geographical, technological or infrastructural factors, scientific justification or the level of protection that the Party considers appropriate.

Other provisions also establish the right to go beyond the international standard. Article 905.3, in referring to the above text of Article 905.1, states:

> Paragraph 1 shall not be construed to prevent a Party, in pursuing its legitimate objectives, from adopting, maintaining, or applying any standards-related measure that results in a higher level of protection than would be achieved if such measure were based on an international standard.

Both of these provisions allow a party the right to determine that a higher level of protection is necessary. In addition, the definition in Article 15 of the phrase "legitimate objective", which is used in the above two provisions, includes environmental objectives:

> legitimate objective includes an objective such as:
>
> (a) safety;
>
> (b) protection of human, animal or plant life or health, *the environment* or consumers (including matters relating to quality and identifiability of goods or services); or
>
> (c) sustainable development,
>
> considering, among other things, where appropriate, fundamental climatic or other geographical factors, technological or infrastructural factors, or scientific justification but does not include the protection of domestic production . . . (Emphasis added.)

This right to impose a higher standard is reinforced by Article 904.2:

> Notwithstanding any other provision of this Chapter, each Party may, in pursuing its legitimate objectives of safety or the protection of human, animal or plant life or health, the environment, or consumers, establish the levels of protection that it considers appropriate in accordance with Article 907.3 [Assessment of Risk].

The Assessment of Risk provisions of Article 907 essentially allow a party to consider such factors as environmental conditions, intended end uses and available scientific evidence or technical information. It even allows provisional technical regulations where there is currently insufficient information to make an assessment. Ultimately, the standard as outlined in Article 907.3 is one familiar to government—arbitrary distinctions:

> Where a Party . . . establishes the level of protection that it considers appropriate and conducts an assessment of risk, it should avoid arbitrary or unjustifiable distinctions between similar goods or services in the level of protection it considers appropriate, if such distinctions:
>
> (a) result in arbitrary or unjustifiable discrimination against goods or service providers of another Party;
>
> (b) constitute a disguised restriction on trade between the Parties; or
>
> (c) discriminate between similar goods or services for the same use under the same conditions that pose the same level of risk and provide similar benefits.

Consequently, the Standards-Related Measures chapter is much more liberal and environmentally protective than the draft GAff provision that requires that standards "shall not be more trade restrictive than necessary to fulfill a legitimate objective."

However, the NAFTA Chapter on Standards-Related Measures poses a major procedural problem for states. It is written from the perspective of national standards—states are not "parties" to the Agreement. As a result, unless implementing legislation gives states a role, we will not be recognized either as participants in standards setting or, more importantly, as defenders of state standards that may be challenged.

With respect to the state-Federal relationship, first, Article 902 requires that:

> Each Party shall seek, through appropriate measures, to ensure observance. . . by provincial or state governments and by non-governmental standardizing bodies in its territory.

This raises the specter that, while national standards can be high, stricter state standards must arguably be preempted by a Federal Government. However, I note that the phrase "appropriate measures" is weaker than the similar phrase "necessary measures" found in similar language in the general provisions of NAFTA that govern the rest of the Agreement and, thus, signals that there can be more circumstances, as discussed above, where Standards-Related Measures will not be preempted and can be stricter on a state level, if based on a "legitimate objective."

The S&P measures, although an improvement over the GAff provisions, are apparently more subject to challenges than the Standards-Related Measures I have been discussing. This is because S&P measures must be "necessary" for the protection of human, animal or plant life, must be cost-effective and, most importantly, must be "based in scientific principles" and "not maintained where there is no longer a scientific basis." Scientific basis is not a requirement for the Standards-Related Measures and thus the challenger's burden of proof to overturn them is heavier.

Unfortunately, the terms of the implementing legislation and side-bar agreements will determine whether NAFTA automatically prevails over state law. The implementing legislation for the existing Canada-United States Free Trade Agreement (which will become a part of NAFTA) states that the provisions of that Agreement prevail over "any conflicting state law" [United States-Canada Free Trade Agreement Implementation Act of 1988, §102(b)(1)(A)].

As noted in "America's Agenda: Rebuilding Economic Strength," the Report of the Cuomo Commission on Competitiveness, existing environmental laws and regulations, including existing stricter state standards, should not be considered barriers to trade. I believe that where state environmental laws and regulations are stricter than Federal environmental laws and regulations and they have a legitimate objective, they should survive challenges. In order to have a chance for survival, however, such standards must be defended. I do not want a guarantee in NAFTA side-bar agreements or implementing legislation that such standards must prevail; rather I want a guarantee of states' rights to defend them against challenges and a commitment on the part of the Federal Government to pay states' costs to defend state standards.

In addition, I note that under Article 913 the parties are to establish a Committee on Standards-Related Measures to facilitate the process by, which the parties make compatible their standards-related measures. This Article also provides for the establishment of an Automotive Standards Council [Article 913.5(a)(iii) and Annex 913.5.a-3] and a Lands Transportation Standards Subcommittee [Article 913.5(a)(i) and Annex 913.5.a-1], both of which explicitly concern emissions from vehicles. NAFTA explicitly authorizes the participation of state governments in the activities of the Main Committee [Article 913.6] and explicitly, on agreement, authorizes the inclusion of state government in subgroups of the Automotive Standards Council [Annex 913.5.a-3,]3]. Side-bar agreements or implementing legislation should mandate such state participation.

STRICTER STATE ENVIRONMENTAL STANDARDS

As discussed earlier, while NAFTA has provisions on S&P measures (Article 7) and Standards-Related Measures (Article 9), it is the standards-related measures that are of primary concern to DEC since they encompass product standards that we impose for environmental reasons. New York's stricter state environmental standards exist either because they represent the state's implementation of requirements of Federal law or the state has determined that they are necessary to achieve another legitimate purpose. I will now discuss the major stricter state standards (mostly air standards) and indicate whether I believe they can be defended.

Of prime concern are the California Motor Vehicle Emission Standards (6 NYCRR Part 618) which impose stricter emission standards on tailpipe emissions than do the Federal motor vehicle emission standards. I believe these have legitimate objectives. Since Federal law permits them, they attain the status of a Federal regulation once they become part of a State Implementation Plan (SIP). They are supported by adequate documentation indicating they are necessary for attainment of ozone and carbon monoxide standards under the Clean Air Act. In addition, state participation on the Automotive Standards Council and the Land Transportation Standards Subcommittee, as discussed above, would help states defend their stricter emissions standards.

Of similar concern are our current and potential future fuel standards under which motor fuel sold in New York might differ from Federal fuels due to environmental considerations. For example, we once had and still might have stricter requirements on fuel volatility, again to reduce ozone precursors, and we now require

oxygenated fuels to reduce carbon monoxide in parts of the State. The availability of alternative fuels such as compressed natural gas might be mandated by the State. All these are legitimate objectives under the Federal Clean Air Act and have been either approved or endorsed by the Federal Government.

Of similar concern are our air regulations on consumer and commercial products (6 NYCRR Part 235) and architectural surface coatings (6 NYCRR Part 205). These require lower levels of volatile organic compounds, a precursor to ozone, in such products in the New York City metropolitan area. Not only were these restrictions authorized by Federal law, they were mandated as part of the existing SIP. Again they are meeting a legitimate objective because they reduce the levels of ozone to protect public health. Similar restrictions exist in other states. Moreover, we believe that New York will be unable to achieve Federal Clean Air Act mandates without these provisions and will face serious sanctions for any such failure.

Our returnable container law and regulations might be subject to challenge as an unnecessary barrier to trade, especially given the recent mandate for curbside recycling. However, the standards-related measure here—a refund value indicated on the container and the necessary accounting for the nickel deposit—serves a legitimate objective in keeping our environment free of litter. Other states have similar requirements.

Another standard that might be subject to challenge is our hazardous packaging standard under ECL Article 37, Title II, which restricts the metals content of packaging material. These standards are necessary to address the problem of heavy metals in packaging which become a solid waste disposal and health problem when landfilled or burned. I believe that our requirements are appropriate and would be sustained as a legitimate objective.

Although our provisions on chlorofluorocarbon compounds under ECL Article 38 could be subject to challenge, especially because they reflect an attempt to protect the global environment (extra-territoriality), they are rapidly being overtaken by other Federal laws and international agreements that have accelerated the phase-out of CFCs.

While the Federal Government is responsible for pesticide residues on food and animal feed, I identify our pesticides registration program under ECL Article 33 as an area that is particularly subject to challenge since in many instances we impose stricter conditions on pesticide usage than does the Federal Government under the Federal Insecticide, Fungicide and Rodenticide Act. We have defended and can defend our registration requirements especially when premised on a different scientific basis. Nevertheless, I believe this is the area where states may be most vulnerable on environmental standards.

DISPUTE RESOLUTION

While the above stricter state standards are defensible, states encounter procedural obstacles under NAFTA in defending them. I do acknowledge that NAFTA contains important procedural provisions which are far superior to those under GAff. For example, where GAff imposes the burden of proof with respect to a challenge on the defending party, NAFTA, by contrast, imposes it on the challenging party for S&P and Standards-Related Measures (Articles 723.6,914.4). This is a welcome change that will benefit states with higher standards. Also, under NAFTA, when a domestic environmental law is challenged, the defending party may remove it to be heard by a NAFTA panel, rather than a GAff or other panel. (Article 2005.4)

However, NAFTA does not mandate that its dispute panels include environmental experts. Also, the panel hearings are not open to the public and all documents are confidential. This is unacceptable. The dispute resolution process must be opened up and environmental experts should be members of any panel deciding an environmental dispute. Only by doing so will we ensure that environmental standards are not "harmonized" (i.e., made compatible) to the lowest common denominator. (See: "Environmental Protection and International Trade: Toward Mutually Supportive Rules and Policies," Harvard Environmental Law Review, Vol. 16,1992, pp.315–317). This will also protect environmental concerns from becoming subservient to trade concerns. (See: "Response of Environmental and Consumer Organizations to the September 6, 1992 text of NAFTA," October 6, 1992, pp.4–5.)

INADEQUATE ENFORCMENT

In addition to NAFTA's effect on environmental product standards, I would also like to briefly discuss its impact on air pollution standards at manufacturing sites. According to the Environmental Protection Agency's interim report entitled "Evaluation of Mexico's Environmental Laws and Regulation," on paper, United States and Mexican standards do not differ widely. However, a significant difference occurs in the degree of compliance monitoring and enforcement. The study cites as an ex-

ample the fact that greater than 90 percent of Mexican industrial facilities do not have permits. Also, air monitoring is virtually non-existent outside of Mexico City, and the national environmental agency has only 19 inspectors nationwide (pp. 4749). Clearly, there exists a widely acknowledged deficiency in Mexico's ability to enforce its environmental laws. While a country's failure to enforce its own environmental laws could be an unfair trade practice leading to the imposition of tariffs, this is an onerous burden that could backfire against the United States. A better alternative is to establish a Trilateral Environmental Commission which could exert public pressure on Mexico to step up enforcement and inform the public on NAFTA implementation. In addition, a share of the wealth anticipated to be generated by NAFTA should be used to pay for stepped-up environmental enforcement in Mexico and for environmental infrastructure (water, sewer, solid waste facilities) to sustain new development.

CONCLUSION

The key environmental provision of NAFTA (Standard-Related Measures in Article 9) is better than the S&P article (Article 7) and is an improvement over GAff. Nevertheless, implementation remains a major state concern in the event stricter state standards are challenged. This is because states are not a party to the Agreement and have no rights in relation to the Agreement. This should be corrected in the implementing legislation or side-bar agreements which should include provisions to:

(1) grandfather existing stricter state requirements;
(2) mandate state participation in the activities of the committee on Standards-Related Measures, and its subgroups;
(3) allow the state to appear on its own behalf to defend stricter state standards;
(4) require the Federal Government to pay state costs of such defense;
(5) open the dispute resolution process to the public and require the participation of environmental experts where environmental laws are under dispute; and
(6) establish a Trilateral Commission and provide adequate funding for enforcement and environmental infrastructure.

TESTIMONY OF WHITNEY TILT, DIRECTOR, CONSERVATION PROGRAMS, NATIONAL FISH AND WILDLIFE FOUNDATION

The you for the opportunity to testify before you today on Federal, state, and private efforts to effectively carry out the Nation's environmental statutes. My name is Whitney Tilt, and I serve as the Director of Conservation Programs for the National Fish and Wildlife Foundation (hereafter "Foundation").

I will focus my comments today on models for cooperative partnerships that enhance the effectiveness of Federal natural resource programs. In presenting these models, it is imperative that this Committee understand that partnerships are just one of the tools necessary for effective environmental protection-they are cost effective and timely in today's political climate, but they are not a silver bullet for the conservation challenges ahead.

FROM LEGISLATION AND LITIGATION TO INVESTMENT

The last 20 years of the "environmental movement" have largely been marked by constituent advocacy, congressional lobbying, and frequent litigation. While these efforts have been effective in achieving broad changes in public policy, behavior, and attitudes, they do not ensure long-term conservation achievement. Evidence of this is seen in our waterfowl populations which remain at or near record lows. Despite 50 years of energetic conservation activity, many inland and marine fish populations are also on the brink of collapse, and the list of endangered and threatened species grows by more than 75 casualties per year. What is missing is investment in conservation—an aggressive, proactive, and positive investment strategy for the conservation of our fish, wildlife and plant resources.

To date, the United States has made tremendous progress in environmental protection, but has stopped short of making a commitment that embraces all segments of our economic strata, anticipates problems before they become critical, and that can be sustained into the next century. In short, we have talked the talk, but shied from making the needed moral and economic investment.

The environmental community is, at long last, reexamining the way it does business. Speaking at the annual meeting of the Natural Resource Council of America, Gus Speth, president of the World Resources Institute noted that it was time to revisit and revamp many of the environmental programs and approaches of the past two decades, and to find new approaches outside traditional areas of environmental

law and regulation. Dr. Speth noted that the environmental laws and programs put into place to date "have accomplished much but have peaked in effectiveness, and they are no match for the challenges ahead (Speth 1992).

In the two decades since the first Earth Day, the United States has promulgated regulations, empowered its legal system, and built the necessary infrastructure of agencies. Citizens have come to recognize the truth in the often heard statement of "think globally, act locally." Throughout the country there are shining examples of how seemingly disparate groups working together can produce results. They remain, however, the exception rather than the rule.

While by no means inclusive, four efforts are of particular importance in improving environmental programs across the Federal, state, and private continuum—education, investment, partnerships, and renewed effort.

EDUCATION

To be ignorant of our environment is to condemn ourselves to failure. We have all heard how our educational system fails to equip children with the basic skills of citizenship. If you think our children's reading aptitude and geography skills are below par, just imagine how their "Environmental IQ" would score. While our children are exposed to some form of reading, writing, and mathematics, the environment is left on the back burner. With our population increasingly urbanized and divorced from the natural environment, can we expect our children to grasp the importance of clean water and wildlife habitats when they have no understanding of where they come from?

Our children, however, are our best teachers. Surveys have shown that it is our children that get adults to start recycling in the home; it is the children who chide us to turn the tap off as we brush our teeth. A survey by the World Wildlife Fund found that a healthy environment for the future to be children's number one concern and that they are not willing to entrust it to adults (WWF 1992). Children have the interest, they are eager to learn what they can do. What has been missing is an effective system for delivering information to them on clean water, wetlands and other natural resources.

Education is the first step, but until such education leads to action, the effort is moot. We cannot simply teach our children and neighbors about environmental stewardship, we must move them to action. Just as a young adult's first trip to the voting machine empowers him or her as a citizen, so too does conservation empowerment begin with translating education into action. To date, agencies like the EPA and Department of Interior have failed to pay appropriate attention to education. To use a wetlands analogy, our conservation education efforts have been like prairie potholes: they are small, vulnerable to economic interference, isolated from each other, and largely ignored. And like our prairie potholes, we are losing them. A renewed cooperative effort among the EPA, Department of Education, Agriculture, Interior and others is the paramount first step. It should also be noted that environmental education is increasingly recognized as an effective way to get children fluent in math and science use.

INVESTMENT

The days of increasingly big government spending appear to be over. The question is whether this is good news or bad news. It can be argued that less government spending need not translate automatically into less conservation. What it should mean is that tighter budgets will force the government, rather than attempting to be all things to all people, to assume its rightful role of policy guidance and oversight while letting local communities and nongovernmental organizations provide the necessary horsepower. Examples of this have already occurred as cities stung by the loss of tax revenues turn over services such as garbage collection or construction of affordable housing to the entity best equipped to provide the service efficiently and economically.

In the natural resources world, we must recognize that the Federal Government does not have the money. necessary to buy all the remaining lands necessary for the conservation of our fish and wildlife. With 75 percent of United States wetlands in private ownership, for example, the Federal Government cannot be expected to buy them all and turn them into National Wildlife Refuges. The same 75 percent also characterizes our forest lands. Even if the government did have the necessary funds, it is more cost-effective to empower the private landowner to protect those lands in his or her best interest as well as the national interest. A feeling of ownership in something yields better stewardship. U.S. citizens know that national parks, wildlife refuges, and other public lands are theirs as taxpayers. But do any of them really feel ownership as they drive up to a park and view the intimidating list of things they can't do?

The Foundation is proof that investment pays dividends. The Foundation works to conserve fish and wildlife resources by providing Federal challenge grants which in turn must be matched by non-Federal funds.

The Foundation is a private, non-profit organization established by Congress in 1984 whose *mission* is to forge partnerships that achieve the conservation of fish, wildlife and plant resources for present and future generations. The Foundation's operating premise is simple: the Federal Government gets leverage for its increasingly tight dollar, grantees get much needed seed money, and the project gets done faster and more economically.

In awarding challenge grants, the Foundation employs the buy-in theory. If a project is viable, then other parties should be willing to invest in it as well—to put their money where their mouth is. The Foundation has consistently proven this axiom. Over the course of the last seven years, 723 grants totalling $85 million in Federal matching and non-Federal challenge funds have been awarded to more than 293 partners in all 50 states and Puerto Rico. Projects have been conducted with 7 Federal agencies, 60 state and provincial agencies, 33 universities, and 193 conservation organizations. For each Federal dollar committed, two additional dollars have been raised for a total of three dollars on the ground. When contributed services and other funds attracted to projects as a direct or indirect result of Foundation challenge grants is considered, the return for each Federal dollar is closer to 6–8 dollars.

The Foundation is also committed to maintaining its cost effectiveness. In FY 1992, 96 cents out of every dollar went directly to the ground in grants while only 4 cents went to the Foundation's operating costs. No portion of Federal matching funds is applied to the Foundation's operating budget. The operating costs of the Foundation are met solely with contributions from private sources, including individuals, foundations, and corporations. A commitment to hold overhead below five percent helps to keep the Foundation lean and cost effective.

While statistics are useful in demonstrating the overall success of the Foundation, it is in the projects themselves that the importance and potential of partnerships is truly recognized. A perfect example is our efforts to restore native fish and their habitats.

The fastest growing list of imperiled fauna is perhaps our native freshwater fishes and mussels. Again, the Foundation is attempting to fundamentally change fisheries management so that ecosystems and habitats are the primary focus of management. Consistent with this programmatic goal, we are funding the "Bring Back the Natives" program with the Forest Service and Bureau of Land Management. In this program, entire riverine systems are managed for native species, especially systems where the Forest Service and BLM have adjacent jurisdictions. There are now 47 different rivers or streams in 15 states, including Montana, that are a part of the program, and it has become one of the agencies most visible and successful programs.

PARTNERSHIPS

The Foundation is living proof that partnerships work—that they build constituencies, leverage scarce funds, and provide a basis for long-term investment. The Foundation has attempted to pioneer a proactive investment strategy geared to partnering the public sector, Federal and state agencies, with the private sector conservation groups and corporate America. The Foundation sits astride the fault line between the public and private sectors, and it works diligently to break down the barriers and the isolation of the principal Federal natural resource agencies such as the U.S. Fish and Wildlife Service, USDA-Forest Service, and the Bureau of Land Management. Years of environmental disputes have created a bunker mentality that is pervasive in state and Federal bureaucracies. The Foundation seeks to accomplish its mission by: 1) working closely with the Federal and state agencies and other conservation interests to identify conservation needs; 2) developing action plans to address these needs; and 3) using its grant making ability to bring the public and private sectors together to initiate an effective response.

Relevant to today's hearing, the Foundation is an entity established by Congress to assist Federal agencies in working more effectively with their nonFederal colleagues. At the time of its founding, the Foundation had a unique charter. In attempting to carrying out our Congressional mandate, the Foundation has been effective is creating a lean, proactive, grant-making organization that has placed a premium on results, not on procedure or protocols.

An excellent example of how partnerships should work are found in the Partners in Flight program. Two years ago conservationists were assailed with the news that neotropical migratory birds—those species that nest in the U.S. and winter south of our borders—have been declining for up to two decades. The news was shocking not

just because the declines were so precipitous, but because the declines have been occurring right under our noses and we have been unable to respond. With characteristic speed, the Foundation designed and implemented a conservation plan that broke the logjam of poor communication and cooperation that has hampered nongame bird conservation for years. Partners in Flight now includes 14 Federal agencies, all 50 state fish arid game agencies, 29 conservation organizations and the forest products industry. This is a proactive coalition emphasizing partnerships to get ahead of the endangered species curve. Our latest newsletter on the program is 48 pages of successful partnerships and on-the-ground conservation.

RENEWED EFFORT

Achieving long-term investment will continue to be a challenge. Conservation history speaks eloquently of the difficulty of funding conservation initiatives over the long-term. Recovery of endangered species like the black-footed ferret, red wolf, and grizzly bear find budgets difficult to maintain alter the immediate survival crisis is past. The North American Waterfowl Management Plan has achieved great success in wetlands protection but is already, in year five of a 15 year program, finding it difficult to maintain funding levels.

In addition to a greater level of education, partnerships, and investment, successful natural resource conservation will take renewed effort. This translates into a willingness to try new approaches, forge new alliances, and adopt new financial structures.

Try New Approaches: The Federal bureaucracy does not reward risk taking. As a rule, the system favors those who master the art of "muddling through." The Foundation was established, in part, to act as an entrepreneurial agent for the U.S. Fish and Wildlife Service. With a relatively small budget, the Foundation works to assist the Service in launching new initiatives, attracting new partners, and educating its employees in partnerships.

In 1988, for example, the Foundation funded development of the first statewide gap-analysis program in the United States. Using GIS mapping techniques first tried on the Island of Hawaii, the Fish and Wildlife Service in cooperation with several state agencies mapped Idaho. The natural resources of the State of Idaho were mapped with land ownerships and other sociobiological aspects to give land managers a tool for the proactive management of natural resources. Gap analysis provides the opportunity to maintain biodiversity on a landscape level within the context of patterns of public and private land ownership. Currently gap analysis is completed or underway in 29 states under the leadership of the U.S. Fish and Wildlife Service.

Coastal Sage Scrub and the Gnatcatcher: Coastal sage scrub occurs along a 150 mile stretch of coastline between Los Angeles and San Diego. The California gnatcatcher and 39 other species of plants and animals belonging to the coastal sage community are being considered for some form of special protection as the coastal sage habitat is increasingly lost and fragmented. The Foundation has been actively supporting measures to protect this valuable habitat in an economically feasible manner through work with the California Resources Agency and other partners. The program entails voluntary collaborative processes designed to protect critical habitat in such a way that developers, conservation organizations, agencies, and residents have a role in the programs design and implementation.

Both gap analysis and the coastal sage conservation efforts represent new approaches to old problems. Both have been developed in government agencies but have looked to involve state and private partners early on in their evolution.

Embrace Non-Traditional Partners. Given the need for new sources of funding and a broader constituency, Federal agencies need to adopt guidelines that encourage partnerships with new, non-traditional players. The Army Corps of Engineers and U.S. Navy are two examples of agencies with extensive natural resource holdings but not viewed traditionally as a natural resource agency. Successful partnerships require that each partner have something to offer—be it time, talent and/or treasury. If a Federal agency comes to the table with a "we can't do this" attitude" and a clutter of ponderous regulations for funding and agency involvement, the partnership is doomed.

New Funding Sources. In the past, conservationists seeking to fund their favorite project looked to the Federal treasury. A new approach, however, is needed for success as Federal budgets continue to tighten. The prospect of being weaned off the Federal dole may be frightening for some, but for organizations experienced in partnerships, the future is bright.

To understand the strength of a partnership, examine its appeal from Congress' view point. Congress is continually bombarded by requests to serve their constituents. In the FY 1994 budget the House and Senate Interior Appropriation subcommittees will receive thousands of requests fcr funding and other add-ons above and

beyond the budget submitted by the President. In each case, the appellants seeking the add-on claim that their project is vital and dependent on Congress's attention. Multiply that claim a thousand times and even the most conscientious Congressional Representative will grow numb.

Consider an alternative: Congress is approached to share in the cost of a project rather than foot the entire bill. Already the appellant has left the pack of favor-seekers behind by requesting Congress to fund part, rather than all, of a particular project. A cost-sharing project comes with an endorsement that other interests view the project of sufficient value that they are also willing to invest in it. Cost sharing tests the hypothesis that if a project is viable then more than just the Federal Government should be willing to fund it. Cost sharing has one other important element—constituency. The building of funding partnerships is akin to the building of constituencies. In the case of Bring Back the Natives, for example, efforts to restore riparian habitats includes the time, talent, and treasuries of state conservation groups, 4H, and other local interests. It becomes obvious to Congress and others that this project is important to area interests.

The Foundation has found the "challenge grant" to be an effective conservation tool. Awarded early in a project's life cycle, it gives the project both legitimacy and a fundraising boost. Most potential funders find the concept of leveraging their own funds very attractive. In addition, a grantee using a Foundation challenge grant to raise additional funds will often identify new supporters who will stay involved with that organization beyond the confines of one specific project.

Challenge grants a not fool-proof however. There must be as much flexibility built into the process as possible. For example, the Foundation has often awarded matching monies up front in order to launch an important project and then subsequently worked with the grantees to raise additional funds. Since we work with Federal funds there is a constant battle over what is the appropriate level of documentation. For a small, grass-roots organization staffed entirely by volunteers, receipt of our grant agreement is often a sobering moment. The challenge for the Foundation is two-fold. First, we must ensure that all Federal funds are expended appropriately in keeping with our trust responsibility. On the other hand, we must constantly work to prevent our conservation grantees from becoming so buried in bureaucratic red-tape, that their ability to do good conservation is compromised. It has been the history of Federal bureaucracies to make grants, cooperative agreements, and contracts, more intimidating, not less. The Foundation works to maintain some balance between accountability, flexibility, and results.

Flexibility and Accountability. Currently, the Federal Government is bound by fiscal regulations that strangle rather than empower. Given tighter budgets in the coming years, efforts must be made to allow the natural resource agencies the ability to use their budgets with the greatest amount of flexibility and in a manner that promotes competition and accountability.

Osborne and Gaebler (1992) argue persuasively for the need to "reinvent government." Among their appeals is development of a mission-driven government rather than a rule-driven one. They cite two specific actions that would help Federal agencies get a better value for their natural resource dollar. The first is to is to allow agencies to roll money from one fiscal year over to the next. Currently, any money left over at the end of the fiscal year must be returned to the U.S. Treasury. Far from promoting thrift, the current system creates broad-scale waste as managers are driven to spend every cent for fear that they will be reprimanded for requesting too much money in the first place and having their budgets subsequently cut. As an alternative, managers should be given the responsibility to manage their own budgets and have the incentive for wise cash management by being able to roll any savings over to the next fiscal year. The second suggestion is the abolishment of rigid line-item budgets in favor of a mission-driven budget. Rather than erecting rigid line item budgets that allow little flexibility or adaptability, a mission-driven budget would allow natural resource agencies the autonomy to move resources where they are most needed. Again, agency managers would have the incentive to save money, and each agency would be forced to shape its budget request to Congress in terms of accomplishments to its mission rather than variances from previous budget line items.

In summary, the Federal Government can improve the effectiveness of conservation programs in the next century. Specifically, we must:

1) foster cooperative partnerships between the public and private sectors;

2) encourage innovative and non-traditional approaches to conservation challenges;

3) reinforce the basic building block of conservation education, especially as it translates into actual into on-the-ground conservation; and

4) make a concerted effort to move away from "command and control" environmentalism to conservation through proactive investment.

This basic movement toward empowering people to take responsibility for their own resources is critical. Despite many successful battles, we are losing the war as far as many species and ecosystems are concerned. I hope the example provided by the National Fish and Wildlife Foundation can help illustrate opportunities for new, and renewed, efforts.

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TESTIMONY OF DAVID R. JORDAN, ASSISTANT ADMINISTRATOR, INDIANAPOLIS AIR POLLUTION CONTROL SECTION, ON BEHALF OF THE ASSOCIATION OF LOCAL AIR POLLUTION CONTROL OFFICIALS AND THE STATE AND TERRITORIAL AIR POLLUTION PROGRAM ADMINISTRATORS

Good morning. My name is David Jordan and I am the Assistant Administrator of the Air Pollution Control Section in Indianapolis, Indiana. I appear here today on behalf of ALAPCO—the Association of Local Air Pollution Control Officials—and STAPPA—the State and Territorial Air Pollution Program Administrators.

STAPPA and ALAPCO are the two national associations of air quality officials in the 55 states and territories and more that 165 major metropolitan areas across the country. The associations' members have primary responsibility under the Clean Air Act for ensuring healthful air quality for our citizens and represent the technical expertise behind the implementation of our nation's air pollution control laws and regulations. I am pleased to have this opportunity to present STAPPA and ALAPCO's perspective on the very important, and certainty timely, issue of the relationship of Federal, state and local governments in implementing environmental statutes.

With respect to environmental protection, the Federal relationship with state and local agencies is indeed a critical one. As air pollution control officials, we are particularly fortunate to have the Clean Air Act Amendments of 1990 as the framework for our efforts. Alter two years, STAPPA and ALAPCO still believe this is a fine piece of legislation and we applaud you, Senator Baucus, and your colleagues on this Committee, for your most significant role in developing this comprehensive and effective statute.

The Clean Air Act Amendments of 1990 assign distinct responsibilities to various levels of government. The Federal Government, and the U.S. Environmental Protection Agency, in particular, is charged with responsibility for developing National Ambient Air Quality Standards to protect public health and welfare, promulgating Federal regulations and guidance, delegating responsibilities to state and local agencies, conducting research, providing funding to state and local governmental agencies and publishing various forms of technical assistance. Further, it is essential that EPA provide sufficient training opportunities for air regulators to ensure that the billions of dollars invested by industry to comply with the Act is well spent.

In turn, state and local air pollution control agencies are called upon to carry out the mandates of the Clean Air Act, ranging from the permitting of tens of thousands of sources across the country, to the monitoring of these facilities and the enforcement of laws and regulations to ensure compliance with all of the Act's requirements.

Although the statute is explicit in its allocation of roles, it remains clear that all levels of government share in the ultimate responsibility of providing the public with clean, healthful air. As former EPA Administrator William Ruckelshaus once noted, the public does not distinguish between levels of government. If any one of us falls in meeting our obligations, we will all be held accountable. Federal, state and local air regulators, therefore, have a vested interest in building upon their partnership and working in cooperation with one another to ensure that deadlines, irrespective of whose deadlines they are, are met.

Fortunately, over the past few years, the working relationship between state and local air quality officials and EPA has developed into a cooperative and mutually beneficial partnership. We are optimistic that under the Clinton-Gore Administration, this partnership will be strengthened further. To ensure such strengthening, we will look to EPA not only to increase its pace and meet the statutory deadlines for issuing regulations and guidance, but also to support state and local efforts to implement additional, innovative air quality control measures.

If EPA is unable to develop the regulations, programs and guidance documents as stipulated by the Clean Air Act, a "domino effect" will occur. The uncertainty related to what will be required federally makes it difficult for state legislatures to know how to craft their programs and regulations. This could cause a delay in state-adoption of regulations, which, in turn, will likely result in a missed statutory deadline at the state or local level. Accordingly, in many instances, penalties, in the form of economic sanctions, will be imposed and, moreover, our ability to provide our citizens with the clean air to which they are entitled will be severely impaired.

Further, in many areas of the country, attainment and maintenance of the health-based air quality standards will require the implementation of additional measures beyond the minimum Federal requirements of the Clean Air Act. In the past, state and local air programs have served as test laboratories of sorts for innovative air quality control strategies. In fact, a number of provisions included in the Clean Air Act Amendments of 1990 are based upon successful programs first implemented on a local level, such as those for oxygenated fuels, market-based incentives, lower fuel volatility limits and transportation control measures. Accordingly, STAPPA and -CO stress the need for EPA to facilitate and support innovative state and local measures, including opting in to the California low-emission vehicle program, implementing more stringent fuel standards and utilizing market-based, economic incentive strategies on a broader scale.

I would like to provide an example to better illustrate how closely Federal, state and local responsibilities are tied with respect to implementation of the Clean Air Act Amendments of 1990. Section 182(b) of the Act requires all Moderate and above ozone nonattainment areas to reduce emissions of volatile organic compounds by 15 percent by 1996. By November of this year, states must submit revisions to their State Implementation Plans demonstrating how they will achieve this reduction.

As state and local air pollution control agencies across the country work to develop strategies that will allow them to comply with the 15-percent VOC-reduction requirement, we are becoming increasingly aware of the challenges posed by this mandate. Moreover, it has become apparent that timely state and local compliance with this important requirement is very much dependent upon EPA development and issuance of regulations, guidance documents (i.e., Control Technique Guidelines) and other technical tools in advance of our November 1993 deadline.

In addition, in some areas of the country, the federally prescribed regulations outlined in the Clean Air Act will not be sufficient to provide a 15-percent reduction by 1996, much less to sustain reductions at a rate of 3 percent per year after 1996, as the Act requires. Therefore, it is critical for EPA to support state and local efforts to pursue more innovative control strategies, such as the California LEV program and cleaner Nell, so that reasonable progress can be achieved and the ozone standard attained.

A final and extremely important issue related to the success of the Federal/state/local partnership is that of funding for air programs. State and local air quality officials are especially pleased that Congress had the foresight to include in the Clean Air Act Amendments of 1990 a provision calling for the assessment of permit fees to generate resources for developing and administering state and local operating permit programs; such a provision would also be well placed in legislation addressing other environmental media. We note, however, that while permit fees are intended to defray the costs of developing the comprehensive operating permit program included in the Act, state and local air quality agencies will still depend upon the continuation of Federal grants under Section 105 of the Act, as well as state and local appropriations to fund additional components of the air program, such as the motor vehicle control program and certain enforcement and compliance monitoring costs. We therefore urge Congress to provide EPA and state and local air agencies with the resources necessary to comply with the mandates of the Clean Air Act in a timely manner.

The members of STAPPA and ALAPCO look forward to working with EPA under the leadership of Administrator Browner and offer to President Clinton and Vice President Gore our support as they continue to pursue the revitalization of our nation's environmental agenda. In addition, we thank you Chairman Baucus, and this Committee, for holding this hearing, which demonstrates your commitment to en-

suring that the goals of our environmental statutes are achieved. Your continued attention to and oversight of this issue are key to the success of our efforts.

Once again, I thank you for this opportunity to testify today ad, on behalf of STAPPA and ALAPCO, offer to you whatever assistance we can provide as you continue to evaluate this important issue.

PAYING FOR FEDERAL ENVIRONMENTAL MANDATES:

A LOOMING CRISIS FOR CITIES AND COUNTIES

Compiled for the United States Congress by

Municipality of Anchorage
Anchorage, Alaska

Tom Fink, Mayor

September, 1992

For release
January, 1993

NOTE: The following has been excerpted from the above-named report. The report, in its entirety, has been retained in committee files.

FOREWORD

Congress imposes a variety of unfunded mandates on states and localities. However, this paper limits discussion to environmental mandates passed to cities and counties. This limitation was elected because, of all the Congressional mandates, environmental mandates are most likely implemented at the local, rather than state, level. They are also the most costly to the entity providing the service.

It is difficult to address the subject of environmental mandates without being depicted by certain groups as "anti-environment." Mayors may disagree with intolerable costs of a rule, with the necessity for regulating when risks are negligible, with the regulatory process itself, or because the science is lacking, or a particular mandate lacks flexibility. None of these positions means they are anti-environment.

To the contrary, many mayors contend the laws and regulations should be more stringent than they are today. Regardless of where they stand on the issue of environmental protection, very few are optimistic that they, and the populations they serve, will be able to finance an ever-growing list of unfunded national environmental imperatives.

The information contained in Parts I through VI of this paper was compiled from countless conversations with city and county officials over a two-year period. Research on the subject was facilitated by industry and government associations and prominent public policy organizations, and through consultations with congressional and administration officials.

Part VII reviews the costs of federally-mandated programs within the Municipality of Anchorage. Each general government department and municipal utility participated in the data collection. Ms. Anne Williams, legislative officer for the Municipality of Anchorage, supervised the cost study and collated the data.

The position paper and cost study were done under the mayor's direction, assisted by Municipal Manager Larry D. Crawford and Enterprise Activities Manager Will Gay.

Paula Easley, for

Tom Fink, Mayor
MUNICIPALITY OF ANCHORAGE

INTRODUCTION

If recent private-sector and government forecasts are reliable indicators, today's environmental programs will not be affordable tomorrow.

Add to today's costs the potential billions of dollars needed for pending and proposed laws and regulations, and the nation's communities could well face irreversible ruin.

The elected leaders of America's cities and counties wonder where it will all end. Some members of Congress agree the problem is serious and say they, too, are concerned. Yet the unfunded environmental mandates keep coming.

The United States Congress has created the problem. It is up to the Congress to fix it.

Over the past two decades environmental problems have been addressed in a vacuum, without carefully examining their impacts on personal incomes, private property rights, the economy, productivity or national competitiveness.

Costly solutions are proposed and enacted into law before they are scientifically justified. Sometimes they respond to perceived--rather than real--risks to humans or the environment. There are no standards for evaluating costs and benefits, nor are there acceptable guidelines for setting national priorities.

At the same time communities search for ways to generate new wealth to pay for environmental mandates, Congress forecloses more options. Hundreds of millions of acres of valuable land are taken out of production and placed off limits, off local tax rolls. There is unreasonable bias against exploring for natural resources and producing the materials needed by society.

Communities find it increasingly difficult to obtain federal approvals to provide essential public services. Both nationally and locally, no mechanism exists for sensibly balancing the needs of people with important environmental concerns.

Paying for Federal Environmental Mandates calls urgent attention to the fiscal crisis communities face. It gives examples and helps frame the issues mayors want debated. It does not presume to give answers, but it does express the desire and willingness of the nation's mayors to be part of the solution.

The guiding principle that "we just can't spend too much on the environment" must be re-examined. Paying for Federal Environmental Mandates tells why.

> *"With environmental budgets stressed...we have a profoundly serious obligation...to take into account the really important risks to health and the environment...we may need some basic recrafting of the statutes, and at least the regulations themselves, if we're to be honest with people."*
>
> *- William Reilly, Administrator*
> *U.S. Environmental Protection Agency*

I. FEDERAL ENVIRONMENTAL MANDATES: A LOOMING CRISIS FOR CITIES AND COUNTIES

For the past two years, news headlines have reported the plight of America's cities and counties: *Services Gutted, Tax Hikes Set Record; Cities Beset by Budget Shortfalls; More Cities Enter Death Spiral; Seven of Every 10 Cities Can't Handle Financial Needs; City's Bond Rating Drops; Bridgeport Bankruptcy Sets Unwanted Precedent; Economic Woes Hammer Counties.*

This paper addresses a major contributor to community financial woes: the growing number of unfunded environmental mandates passed by Congress to political entities that provide direct services to their residents. It is written to focus attention on the problem and to urge Congress to solve it.

While mandates are no laughing matter to local elected officials, City and State columnist Joe Winski provides a tongue-in-cheek definition of the term. In the context of government, he says, mandate is French for "Let's stick it to the suckers." Mandate is itself an outgrowth of the new federalism of the Reagan administration, which Winski defines as "Washington passes the buck."

The columnist reminds us that during the 1980s, Congress began passing the buck to the states by greatly reducing revenue sharing, at the same time keeping the programs it formerly funded, and adding ever more costly new programs. "The states, no dummies, quickly learned to pass the buck to jurisdictions even lower on the government food chain, cities and towns."[1] Last on the food chain are the taxpayers and consuming population who ultimately pay the bills, while also paying interest on all levels of government borrowings. Yet one seldom hears a Congress member announce that the legislation the member just supported would be financed by local tax increases on his or her constituents.

A. Why Mayors are Concerned

Whether it be budgets for hazardous waste handling, asbestos abatement, clean water and air programs, land acquisitions for endangered species habitat, removal of underground storage tanks, or mitigation for wetlands development, municipalities are charged with financing and implementing scores of additional mandates yearly. To meet

[1] "Mayor on Non-funded Mandates: 'Stuff it!'" City and State, (May 6, 1991).

these needs mayors say they have to "rob Peter to pay Paul" to avoid going in the red. At the same time, Congress lacks this bottom-line restraint.

One of the more frustrating aspects of the environmental mandate crisis for mayors and other local officials--aside from the fiscal impact--is the loss of control over their budgets and decisionmaking powers as ever more mandates are arbitrarily imposed under a one-size-fits-all mentality. It's "Do it, whether or not the environment will benefit." Or, "Do it if you want your highway funds."

Mayors complain that higher levels of government now set the priorities, making decisions, without consulting local officials, that have monumental impacts on municipal budgets and private-sector economic opportunities.

Of equal concern is the growing tendency for the Environmental Protection Agency to make or override local land-use planning decisions. While communities are convinced Congress never intended federal agencies to make zoning decisions, it is happening today by way of environmental regulation.

B. Mayors are Too Busy Minding the Store

Few mayors are able to monitor, consistently and effectively, the onrush of congressional and administration proposals that affect them. For example, a recent solid waste rule released for public comment, with significant budget implications to municipalities, brought responses from just ten of them. Other reasons they hesitate to respond:

1. Mayors are too busy with municipal responsibilities to devote precious time to long-range federal policies that might affect their communities.

2. Mayors might not be aware that other communities are having the same problems they are experiencing, e.g., delays in obtaining Section 404 wetlands permits. Since they feel their problems are isolated or unique, they assume members of Congress won't be moved to address them.

3. Because environmental mandates are "unknowns" buried in municipal budgets or regulatory processes, it has been difficult to get a handle on their magnitude. Administrators have found there is no easy way to isolate their costs.

4. Mayors seldom have adequate budgets for congressional liaison activities. Many lack staff with the broad range of expertise needed to monitor legislative issues or respond to action alerts by municipal organizations, trade groups or other mayors.

5. They lack public support for such liaison and activism.

C. Mandate Mania

Unquestionably, the federal mandate situation has become a much higher priority to cities and counties as the costs of new programs become more clearly identified. These costs can be enormous and incalculable, making budgeting and long-range planning impossible.

Tom Arrandale, environment columnist for Governing magazine acknowledges, "...state and local pollution-control officials suspect that they're wasting precious time and resources--while jeopardizing precarious public support--because federal mandates based on inconclusive or inaccurate studies force them to focus on the wrong environmental problems."[2]

And, there is the problem of uncoordinated restrictions, redundant regulations and contradictory requirements of different agencies. The EPA says build a landfill. The Army Corps won't let it be put anywhere. A solution to one environmental problem creates a worse one. Mayors find it virtually impossible to obtain approvals to site facilities such as incinerators, sewerage treatment plants, reservoirs, dams, and power plants.

Equally disheartening to local officials is the federal administration's and Congress's proclivity for underestimating, by the billions, the costs of "clean" to America's cities. Local officials see a compelling need to draw the line, for Congress to differentiate between environmental necessities and environmental luxuries, and to address the more serious priorities first.

They especially dislike federal agencies' (namely the Environmental Protection Agency's) arbitrarily vetoing projects deemed necessary by a community's residents and their duly-elected political leaders--Colorado's Two Forks and Virginia's Ware Creek dams and reservoirs are just two examples.

These arbitrary actions by unelected, unaccountable federal officials disregard the millions of dollars communities have invested in projects that must then be recovered from tax and ratepayers. Equally distressing, the vetoing agency is not required to propose a feasible alternative it would approve.

Finally, mayors complain their concerns are not perceived as high priorities on the congressional issue agenda. Baltimore Mayor Kurt Schmoke eloquently expressed these views during the Mayors' March on Washington last fall:

> In ordinary times...we wouldn't have to remind our national leaders that cities are still the financial, cultural and intellectual centers of our country, and without cities, we are a land without a soul, and a nation without a purpose.
>
> These are times that cities are having to make Draconian budget cuts...that mayors are having to choose between school textbooks and hiring additional police; between freezing teacher salaries and laying off

[2]Tom Arrandale, 'Junk Science' and Environmental Regulation, Governing Magazine, (June 1992), p. 82.

> sanitation workers; between sheltering the homeless and abating lead paint; between treating crack babies and treating rape victims.[3]

When an area's chief elected official is on the hot seat over budgets for escalating crime rates, crumbling infrastructure, rampant drug abuse or sheltering the homeless, the likelihood of spending money to create wetlands or undertake asbestos abatement becomes very slim.

While this paper addresses only federal environmental requirements, local governments are also concerned about overlapping mandates by state governments. However, until local government's costs are quantifiable and constituents relate the costs of mandated programs to their own pocketbooks, state legislators will continue to respond to demands for open-ended environmental requirements.

Public awareness may be the most underestimated mandate of all. Mayors are beginning to recognize the need for their constituents to better understand the costs and purposes of existing environmental mandates before new ones are proposed. Without this understanding, mayors fear there will be a major backlash against any new environmental program, regardless of its importance.

D. Champagne Tastes and Beer Pocketbooks

As the list of cities with budget deficits grows, it becomes apparent that a major roadblock to solvency is the "champagne tastes and beer pocketbooks" of all levels of government and the taxpayers themselves. There is not enough money for existing programs, let alone new ones, mayors say, a situation exacerbated by the widespread recession.

Drastic cuts in state and federal aid and lost revenues from business failures, property devaluations and a shrinking employment base have caused urban governments to sharply curtail or eliminate entire programs.

On the matter of financing for environmental infrastructure, Max Whitman, President of the American Public Works Association, reminded members of the U. S. Advisory Commission on Intergovernmental Relations on December 6, 1991, that:

> ...state and local governments do not have inexhaustible funds and must be prepared to budget for environmental protection on the front end of the project. Generally we must by law balance our budgets and raise funds through taxes and bond issues. We cannot afford local environmental protection that does not make economic sense.

The Nationwide Public Projects Coalition, which was formed by state and local elected and career officials principally to seek affordable balances in the nation's environmental protection processes, pointed out in a recent newsletter that:

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[3]Nation's Cities Weekly, (October 21, 1991).

> U. S. senators and representatives increasingly regard local governments as just another special interest group when they protest the fiscal impacts of unfunded federal mandates. There seems to be a growing attitude that mayors and city council members should just shut up and raise taxes. It is almost as though they believe constituents of cities and counties are different people from those who make up congressional constituencies.

Every city has its horror stories, and elected leaders face increasing frustration dealing with angry taxpayers as revenues decline and government costs escalate.

Although northeastern and southern cities may have suffered the most budget shocks in recent years, geography has spared few the impacts of job losses, spiraling crime rates, declining populations, growing social and welfare needs and, of course, more federal mandates.

At the same time the EPA projects environmental protection costs will climb to nearly three percent of Gross National Product by the year 2000, there has been a stunning decline in general community infrastructure investment. No new airports have been built since the early 1970s. Spending to rebuild dangerous bridges, crumbling roads and highways has plummeted from 2.4% of GNP in 1963 to one percent in 1991.

It would add credence to the debate over costs if mayors had an inkling of their costs to comply with, say, the Safe Drinking Water Act regulations. However, according to Thomas D. Hopkins, only sketchy information on the numbers and costs of mandates to the delivering level of government is available. The FY 1992 Budget of the United States reported that 1200 new rules were added in 1990 alone. The October 1991 Unified Agenda of Federal Regulation listed nearly 500 new regulations likely to affect local governments. Not even a cursory study has been done to project the cumulative costs of these new regulations and when they will take effect.[4]

In the past, water pollution control programs mandated primarily by the Clean Water and Safe Drinking Water Acts have been responsible for about half of municipalities' compliance costs, according to the Environmental Protection Agency.

The agency estimates another third of compliance costs results from mandates of the Clean Air Act. The remainder is attributed to a variety of land pollution programs mandated by the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Toxic Substances Control Act, (TSCA). Also included in the final category are the Emergency Planning and Community Right to Know Act (EPCRA) enacted with the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the Occupational Safety and Health Act of 1970 (OSHA).[5]

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[4]Thomas B. Hopkins, The Costs of Federal Legislation: (The National Chamber Foundation: 1992). Hopkins is Gosnell Professor of Economics at Rochester Institute of Technology, Rochester, New York, and served as deputy administrator of the Office of Management and Budget's Office of Information and Regulatory Affairs.

[5]Environmental Investments: The Cost of a Clean Environment, (U.S. Environmental Protection Agency, December 1990).

EPA's breakdown does not reflect the compliance costs cities incur preparing environmental impact statements required by the National Environmental Policy Act (NEPA), the increasing restrictions on land and natural resource uses, which affect local and state revenues, or the enormous costs of litigation made possible by the Act.

There are other indirect costs not reflected in summaries of environmental costs. Nowhere is there an analysis of the reduction in private-sector investments directly related to environmental constraints. Undoubtedly, plant closings, delayed expansions, dampened innovation and workforce reductions adversely affect a community's ability to pay for environmental or other desirable improvements.

As noted earlier, until the mid-1980s, mandates to build big-ticket anti-pollution facilities carried congressional appropriations to offset most of the costs, but times have changed. Now community governments, their businesses and their residents pay nearly all of the costs.

Anchorage's Mayor Tom Fink says "residents don't understand that virtually everything we do, every service we provide, every bond we sell, and every employee's salary and benefits are paid for by the people who live here, through taxes and user fees." Or, as Dr. Ralph d'Arge points out,

> There's no disembodied entity called industry that you can either tax or save money for without that trickling down to some individual somewhere.[6]

It is only fair that Americans writing the checks know what they're getting for their environmental protection dollars today and what they can expect in the future.

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[6]Dr. Ralph d'Arge, John S. Bugas Distinguished Professor, Dept. of Economics, University of Wyoming, in a speech entitled "Evaluating Aesthetic Effects of Air Pollution," August 25, 1982.

VI. CONCLUSION

Finding Solutions

The United States Congress has, over time and with good intentions, contributed to the problems referenced in this paper. It is up to Congress to find solutions to them. If they are to be workable solutions, however, the elected leaders of America's communities must be involved in the problem solving process.

Fortunately, Congress and the administration, encouraged by EPA Administrator Reilly, now recognize the role that better risk assessment methodologies can play in setting environmental priorities. Both appear to be devoting more resources toward establishing a more rational, risk-based regulatory framework. From local government's perspective, the outcome can occur none too soon.

Private organizations devoted to policy analysis, such as the Center for the Study of American Business, the Institute for Regulatory Policy, the National Chamber Foundation, Harvard's Center for Risk Analysis, the National Research Council's Committee on Risk Assessment Methodology and others have made significant contributions to the debate. So have a sizable group of scientists, medical professionals, attorneys and industry leaders who have studied and published their findings.

Of particular note are the research and policy recommendations of the Institute for Regulatory Policy which has crafted a presidential executive order, being widely endorsed, as a workable approach for making risk assessments and risk management decisions more objective, more understandable, and more consistent among all federal agencies.

However, before a more responsible, cost-effective environmental policy can be crafted, national leaders must find answers to these questions:

(1) How much environmental protection are communities already obligated to fund? What measures can be used to determine if they can afford additional requirements?

(2) What recourse should communities have when congressional or administrative projections of local implementation costs are drastically understated? Should Congress set dollar limits at which it must reconsider inaccurately-costed measures?

(3) Do all communities face the same environmental problems? If the answer is clearly "no," how can fairness and flexibility be built into the regulatory process?

(4) Is Congress encouraging communities the flexibility to address their most important environmental priorities? If not, why not?

(5) Should Congress force communities to "throw good money after bad" when new science disproves or renders obsolete a legally-mandated rule or procedure? How can bad rules be undone?

(6) If the cost-per-predicted-premature-death of a measure is excessive, what criteria can Congress use to decide whether compliance should be required? Who should decide the threshhold limits of "excessive"?

(7) Substantial progress has occurred in developing techniques for measuring the costs of environmental regulations. What efforts should be undertaken to more effectively measure the benefits of regulations?

(8) How can risk analysis be applied to formulate new direction for environmental policy in the 1990s? What actions are needed to accelerate current efforts to set environmental priorities based on sound risk analysis policy?

(9) If 95% of a problem has been solved, should large amounts be spent on the remaining 5%? Or, should those dollars be redirected to where they will be more cost effective?

(10) How will Congress resolve the growing conflict between humans and species, e.g., habitat protection vs. jobs, or protection of the ethereal ideal of biodiversity vs. clearing land for housing?

(11) Assuming the "takings" provision of the U. S. Constitution is to be upheld, what mechanisms can Congress establish to both protect private and local government property rights and acquire property for environmental purposes?

(12) And, finally, should Congress impose a moratorium on new mandates until a national environmental policy is crafted, with input and review by the governing entities responsible for implementing it?

TAKING STOCK OF ENVIRONMENTAL PROBLEMS

FRIDAY, JULY 16, 1993

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

SUSTAINABLE DEVELOPMENT

The committee met, pursuant to notice, at 10:08 a.m. in room 406, Dirksen Senate Office Building, Hon. Max Baucus [chairman of the committee] presiding.

Present: Senators Baucus, Kempthorne, and Durenberger.

OPENING STATEMENT OF HON. MAX BAUCUS, U.S. SENATOR FROM THE STATE OF MONTANA

Senator BAUCUS. The hearing will come to order.

I want to apologize to the witnesses for the delay. I am on the Intelligence Committee; there is a very contentious markup on the budget, and I felt that maybe they could resolve it better if I left than if I stayed.

[Laughter.]

Senator BAUCUS. So we're here.

I want to thank our panel for the time and effort that they have devoted to this question before us today. This is the third in a series of "taking stock" hearings which I have convened, and the purpose is really twofold. First, it is to examine the accomplishments and shortcomings of our current environmental laws and to determine what lessons we have learned in the process; the second is to consider how to apply those lessons learned as we embark on a process to achieve a sustainable future.

To help answer these difficult questions we have before us two former Administrators of the Environmental Protection Agency who have, combined, over half a century of experience in developing and executing the environmental laws in existence today. In addition, we will hear from two individuals selected to chair the President's Council on Sustainable Development.

In a hearing of this committee last year, Senator Edmund Muskie, a distinguished alumnus of this committee, stated the problem at hand quite well when he said that today's environmental problems are "more complex, more subtle, and more politically challenging" than the problems that he and this committee faced 20 years ago.

There are two conclusions that I draw from this statement. First, that we have solved, or are on our way to solving, many of the environmental crises that faced our Nation a generation ago; and second, that the difficult problems that remain cannot be fixed using the same policies and approaches that have worked for us in the past.

The first wave of environmental law and policy has borne results. For example, according to the EPA, between 1970 and 1991 lead levels in the air decreased 98 percent, and carbon monoxide decreased 50 percent. In the same vein, by 1988, 70 percent of the Nation's rivers had met water quality standards that support such uses as fishing and swimming. And even in the short time between 1988 and 1991, reported total releases and transfers of toxic chemicals declined by 31 percent.

But much more work remains to be done. Now we must address less visible, more subtle problems, such as global warming, the thinning of the ozone layer, and losses in biodiversity.

I agree with Senator Muskie that these problems are complex and subtle. They ignore State and national boundaries, and thus we must consider the regional and global consequences of our actions. This also means that States and countries must work together to develop and implement solutions.

In addition, we now understand that controlling pollution in one medium at one time may not be the best approach. For example, tighter controls on airborne releases of some chemicals can result in greater releases into the water or into the soil.

Leaders in the environmental community and in business agree that fundamental changes are needed in environmental laws to address these new challenges. The National Commission on Environment unequivocally concluded that "if America continues down its current path, primarily reacting to environmental injuries and trying to repair them, the quality of our environment will continue to deteriorate, and eventually our economy will decline, as well." The members of that commission were representative of the stakeholders in the debate about environmental policy. We are fortunate to have two of them here today, including Chairman Russell Train.

What will this new regulatory and legal framework look like? And how do we get there from here? No one is sure of the answers, but the goal is quite clear, and that goal is sustainable development. A fundamental premise of sustainable development is that economic growth must be achieved while conserving our natural resources and protecting the environment. The strength of this Nation's and the world's economy and standard of living are dependent on achieving this goal.

Last year at the United Nations conference in Rio, leaders of governments from all over the world agreed that sustainable development should be the goal of all our environmental and economic policies. Now is the time to turn that goal into reality. That is why the President has established a special advisory council to develop specific policy recommendations for a national strategy for sustainable development. We are pleased to have the co-chairs of the council with us today to discuss their plans for achieving this goal.

What have we learned from past experience in formulating environmental policy? And how do we apply that knowledge in the

future? Can the competing interests of development and conservation, aggressive economic growth and environmental protection, be harmonized?

We look forward to hearing from the witnesses on the answers to these very crucial questions facing the U.S. and the world today.

Senator Boxer was unable to attend today's hearing and has submitted a statement for the record.

[Senator Boxer's statement follows:]

STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Mr. Chairman, I want to thank you for holding the third in a series of hearings to take stock of the nation's environmental policies. Today's hearing focuses on environmental sustainability—an issue that should probably be the basis for everything else that this Committee does.

I am pleased to see that we have two distinguished former Administrators of the EPA to testify before us, as well as representatives of industry and the environmental community.

I will look forward to hearing your testimony and your thoughts on what this Committee should do to advance the issues that come under the "sustainable development" umbrella.

Mr. Chairman, there is a growing sense that we are at a turning point in the history of environmental policy. Past efforts have been focused on repairing damage to our land, oceans and waterways. Those efforts have been absolutely appropriate, and while considerable progress has been made, much remains to be done.

But more and more we are discovering that we can anticipate and prevent damage to our environment and conserve our limited natural resources.

Another important discovery I think we are in the process of realizing, is that pollution prevention and conservation can go hand in hand with economic progress. This Committee has heard from several industry witnesses who have talked about the connection between pollution and waste—between environmental destruction and economic inefficiency.

I believe we may be on the verge of a revolution in the way we look at environmental protection, as it becomes clear that long-term economic strength depends on having a clean, healthy environment.

As the way we view environmental issues evolves, it is important that we make sure that our environmental laws and regulations remain effective. We are only beginning to seriously consider how to create incentives for pollution prevention; how to encourage the development of new environmental technologies; how to change corporate environmental ethics; and—perhaps most importantly—how to educate ourselves and our children about creating a sustainable environment and economy.

The members of this Committee will have to address each of these issues, and again, Mr. Chairman, I thank you for taking the lead on this. Finally, I would note that the President has recently announced the creation of a Presidential Council on Sustainable Development.

I commend the President for recognizing the importance of these issues, and look forward to working with the Council and with my colleagues to make sustainable development a reality.

Senator BAUCUS. I would like now to begin with the panel. Ordinarily we limit witnesses to five minutes, but since you're the only panel and I think this is going to be more of a free-wheeling discussion and therefore less formal than some other hearings, I would like each of you to give your statement. I'm not going to hold you to a specific time, but obviously, I urge you to be succinct in consideration of other witnesses.

I will begin with you, Mr. Train. Welcome back to the committee. It is a great honor to have you here.

STATEMENT OF RUSSELL E. TRAIN, CHAIRMAN OF THE BOARD, WORLD WILDLIFE FUND; AND FORMER ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY

Mr. TRAIN. Thank you, Mr. Chairman. It is a pleasure to be here. It's a dangerous invitation, as we might go beyond five minutes. I will try to keep myself to five minutes to give the others more of an opportunity to expand.

The questions you have raised are essentially the issues which were addressed by the National Commission on the Environment, convened by the World Wildlife Fund and chaired by me in its report issued last December entitled "Choosing A Sustainable Future." My fellow panelist, Bill Ruckelshaus, was a distinguished member of our commission, as you have noted, and made outstanding contributions. I commend the report to you and ask that its summary statement be included in the record of this hearing.

Senator BAUCUS. It will be included. (See p. 247.)

Mr. TRAIN. As its title indicates, the focus of our report and its integrating principle is the pursuit of sustainable development. The entire sustainable development challenge comes into focus when we recognize that in the next 50 years, economic activity in the United States is projected to quadruple, and that during that same 50-year period global population levels are projected to at least double, with emphasis on those words "at least," with more than 95 percent of that growth occurring in the poorer nations of the south.

Given the difficulties we have in dealing with current environmental problems, it is difficult not to conclude that environmental challenges of the future will dwarf those of the present. In order to grapple effectively with those challenges we are going to require a vision of the future that integrates economic advancement with the continued health of the natural systems which underpin all economic, and indeed all other, human activity. Quite simply, there is no other way.

Sustainable development is not so much a quantifiable objective as a strategy for improving the quality of life while preserving environmental integrity. It means living off nature's interest, not running through its capital. Sustainable development means leaving future generations at least as many options as we enjoy.

The issue is best addressed not in generalization but in a specific context. Thus, reliance on fossil fuels as our principal source of energy is not sustainable over the long term. Land-use activities that destroy habitat and erode biological diversity are not sustainable. Agricultural practices that reduce the natural fertility and productivity of the soil are not sustainable. Fishing practices that deplete fish stocks below replacement levels are not sustainable. Environmental policies that focus on after-the-fact cleanup rather than on pollution prevention are also not sustainable, and so forth.

World Wildlife Fund is working specifically in a number of areas that promote sustainable development. Some reference to these may help illustrate what this subject is about:

The reduction in use of toxic materials by industry; pollution prevention; pesticide reduction and sustainable agricultural practices; sustainable fisheries management; the impact of consumption

patterns and of trade policies on biodiversity; the promotion of sustainable management of tropical forests; the promotion of energy efficiency programs, including helping to launch energy efficiency centers in Prague, Warsaw, and Russia; sustainable timber management in our National Forests; promotion of ecologically sound tourism, plus a large number of specific conservation projects worldwide that emphasize sustainable development.

As to specific recommendations for this committee, I would urge, as did our commission, that high priority be given to the development of a national environmental strategy, mandated by legislation. Such a strategy should focus on the goal of sustainable development. A new Department of the Environment could have the lead in developing this strategy, in close cooperation with other agencies and the Congress. The new Presidential Council on Sustainable Development, co-chaired by my fellow panelists Jonathan Lash and Dave Buzzelli, can certainly make a major contribution toward accomplishing this goal.

Second, new emphasis should be placed on market mechanisms in achieving environmental change. There is no more important factor in this regard than pricing. The classic case of the failure to internalize environmental costs is that of gasoline. In real dollars, the price of gasoline is lower now than it was 20 years ago; even with an additional tax of $1 per gallon, the price would be about the same as premium in 1981. As a result, more people drive more.

Adverse impacts of the growing appetite for and dependence on gasoline are familiar: climate warming; urban air pollution and associated health effects which fall most heavily on the poor; oil spills; congestion; urban sprawl; dependence on foreign sources of oil, which in turn contributes to our large trade imbalances and adversely affects our national security, among other effects.

Unless the costs of these impacts are reflected in the price of gasoline, the problem will only grow. In the past 20 years, vehicle miles traveled have increased by 90 percent.

Third, our Government should promote the development of green technologies. Several bills have been introduced along this line, including one by you, Mr. Chairman, and I urge their prompt consideration.

Fourth, the United States must exercise strong and committed leadership addressing environmental problems here and abroad. It is disheartening that after all the high-flown rhetoric at the Earth Summit in Rio a year ago, just about every major industrial nation, including the United States, has slashed the budgets of their environmental agencies. That development sends a clear warning that one of our most difficult challenges will be how to maintain environmental priorities in the face of the competing claims of depressed economies and worldwide political instability.

Let me just inject at this point: I have not said anything about trade, but in my opinion liberalized international trade, free trade, and I refer specifically to NAFTA, is a high priority way of approaching the problems of depressed economies and worldwide political instability, and thus important in a broad sense to our environmental needs and sustainable development.

Finally, it is important to develop an environmentally literate society that respects environmental values and assumes responsibil-

ity for putting those values into practice. Detailed recommendations in this regard can be found in my complete statement.

In the interest of time, Mr. Chairman, that concludes the summary remarks. Thank you very much.

Senator BAUCUS. Thank you very much, Mr. Train. I appreciate those remarks. You have tremendous experience and a tremendous reputation, and everything you say is taken with great seriousness.

Mr. Ruckelshaus, the same remarks apply to you, too.

STATEMENT OF WILLIAM D. RUCKELSHAUS, CHIEF EXECUTIVE OFFICER, BROWNING-FERRIS INDUSTRIES, INC., HOUSTON, TEXAS; AND FORMER ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY

Mr. RUCKELSHAUS. Mr. Chairman, I was just pausing to wait for you to say that.

[Laughter.]

Senator BAUCUS. I got your cue.

[Laughter.]

Mr. RUCKELSHAUS. I very much appreciate your invitation to appear.

In his opening statement Mr. Train mentioned that in the next 50 years he expects the economic activity of the United States to quadruple. You mentioned in your opening statement that, combined, we represent 50 years of trying to regulate our economy. I suspect that if in the next 50 years we were given that same assignment again, we could probably halve that rate of growth in the economy. Maybe not.

You have asked me to talk about the various regulatory tools that are now in use and how to adapt them to suit the environmental challenges that we face today and will face in coming years, and about the prospects for achieving sustainable development. What I would like to do is summarize the statement that I've submitted and just read some relevant paragraphs, Mr. Chairman.

It seems to me that the first tool we ought to study is the calendar. It's not 1970 anymore, it's 1993. It's not even 1980. The regulatory tools we developed for the environmental problems of decades past, in my view, are not adequate to those of the present, and far less than those that we can see looming clearly in the future. Worse than that, these antique control systems may actually impede the tasks before us.

Primary among those tasks is the drive to make the human economy environmentally sustainable. This is what is meant by the term "sustainable development." In my statement I discuss the origin and usefulness of this concept and its appropriateness for this hearing.

The concept itself predated the World Commission on Environment and Development that was chaired by the Prime Minister of Norway, Gro Harlem Brundtland, and on which I served, but that commission certainly gave the phrase "sustainable development" a good deal more currency than it had in the past. After three and a half years of deliberations in which we met in every region of the world for three weeks every quarter—we spent an enormous amount of time together—we came to the unavoidable conclusion

that the central problem facing mankind in the latter 20th century and beyond was how to alleviate the poverty of two-thirds of humanity without, at the same time, severely damaging the biological resources of the planet. I then discuss some reasons why we came to that conclusion.

Our final conclusion was that we believed sustainable development was the solution to this complex of problems that were outlined by the World Commission.

One thing that has become clear since these ideas were first voiced is that the less developed nations will not act simply because we tell them we think they should. The only thing that will cause them to act in terms of our own recommendations is an example set by the United States. I think this recent conference that Russell Train mentioned, down in Rio, underscores that view.

Here it is essential—and I echo something that Russell just said—that the United States regain its former lead in environmental affairs because in my view we are really the only Nation capable of demonstrating a sustainable economy on an appropriate scale. We have the technology, the know-how, the experience, the environmental infrastructure which includes both public attitudes and environmental regulatory regimes that have been set up at every level of government, and indeed, the wealth to do the job to show the rest of the world how sustainable development can in fact take place.

I don't believe we will proceed as we ought to, nor will we exert the influence we ought to around the globe, unless we change the way our environmental policies and programs actually work.

The regulatory philosophy that lies behind our environmental programs has been called "command and control." It is my view that we must evolve from command and control to something much different, and I would not suggest that the command and control approach that we started, really, with one of your predecessors, Senator Muskie, whom you mentioned in your opening remarks, hasn't done a lot of good. I think it has. The environment is much cleaner than it was in this country, vastly cleaner than it would be had we done nothing. And that isn't to say that we don't still have many environmental problems in this country; we do. I believe that many of those problems, particularly those that we began to address in the early 1970's, have not gone away. In many respects they never go away, but they are under social control.

So command and control regulation works up to a point, but beyond that point you can spend a lot of money and not get much environmental benefit. In my remarks I talk about why I believe that is so. I won't dwell on that here, but this is the point at which I believe we now find ourselves. The Administrator of EPA must follow the rules of nine major statutes, none of which was designed specifically to work with one another. There is no integrating principle at all built into this statutory armory. Each is written to stand alone, as if the world were made entirely of air or water or some other target of our concern. No word in all this law directs EPA to simply find the combination of policies across all programs that will garner the maximum benefit to the environment for every dollar of cost expended.

There is worse. Running through the strata of statutes like a vein of ore, written into the language and the intent of the law, is the assumption that the EPA cannot be trusted with discretion. The environmental statues of the United States exhibit a degree of rigor and specificity, all enforceable by the courts, unknown in other nations or, indeed, in any other branch of Federal law.

In my view, it is easy to see why this came about in the early 1970's under the shadow of the Vietnam War and Watergate. Those were not the best times for devising a set of laws in which confidence by the Legislative Branch in the good intentions of the Executive Branch played an important role. That's why it's not surprising, but the Administrator of EPA is thus largely stripped of the opportunity to make sensible judgments about environmental damage and what should be done about it. I give a couple of examples of what I'm talking about in my statement.

In fact, most of our environmental judgments are ultimately made in the courts. I remember when I went back to EPA for the second time, and it was the last time, I was there three days and made a couple of decisions that had been left on my desk. I was immediately sued by three parties in the case of one decision, two in the case of another. I asked our General Counsel, "Would you go back and look for the last five years and tell me how many decisions that are appealable to the courts have been made by the Administrator? Go back to the Carter Administration; don't just stay in the Reagan Administration. How many have actually been appealed to the courts?" He came back a week later with the answer; it was 80 percent of those decisions. Further review showed that it took between three and five years in the court proceedings to finally come to a decision as to what should be done.

At the very least, that's an inefficient way to go about making environmental policy in this country. I also happen to believe it's unwise. I don't think it's a proper role for the judiciary. I think it's absurd that after months of congressional debate, after sometimes years of study and deliberation by EPA, the decision about what some factory in Michigan is actually going to do about its pollution rests in the hands of some District Judge.

Thus we find ourselves with an environmental regime that is not only unnecessarily slow and clumsy, but that exacerbates the very mistrust that created it in the first place. Consider that you pass an environmental bill with lofty goals, strict timetables, and an open invitation to sue. Years pass and the goals are not fulfilled. The program is often locked up in court. Someone must be responsible for the failure, and people usually decide it's the Administrator of the Environmental Protection Agency. The ritual public torment of EPA Administrators has become a standard feature of environmental politics in this country; certainly, Mr. Train and I have not been immune from that ritual. Meanwhile, no one is looking at that judge up in Michigan or the judge in the District of Columbia and asking who is really running the environmental programs—or our trade policies, for that matter—in the name of protecting the environment.

It should now be clear, after 20 years and a succession of different Administrations, that such blame-slinging, however politically satisfying, is of no real use. Failure to progress as we would like is

not the fault of EPA, at least not in every instance, but largely that of the tools. A new set of tools must therefore be provided, and Congress must forge them. We need to begin, as Mr. Train has suggested, with a national environmental strategy. His commission recommended that; I then again state some of the same recommendations that he went over in his statement.

I do think that one finding of his commission that should be emphasized is that the environmental legislation must be revised so that conflicting and antiquated statutes are replaced by a new, organic act directing the EPA to protect the environment in an integrated and cost-effective manner, with a new focus on pollution prevention. The committee structure of the Congress should be revised as well so that the EPA reports to a single committee in each House. The number of committees has proliferated in terms of EPA's reporting responsibilities. When it was first formed in 1970 we had 15 committees that we inherited from the agencies and departments that made up the various pieces of EPA when it was first formed under the Executive Reorganization Plan. That number of committees has now expanded to something like 50, and it really is a tremendous burden for EPA to discharge.

The conclusion must be that the totality of environmental law yields the perverse effect of preventing the EPA from doing its best to protect the environment. Most of all, honesty and trust must be restored to our environmental law. Honesty means not devising environmental goals that we cannot reasonably achieve at costs that our people are unwilling to pay.

We have at last to face the fact that Americans love both the environment and the most polluting lifestyle on earth.

[Laughter.]

Mr. RUCKELSHAUS. With time, a greater and greater proportion of insults to the environment will come not from the industrial plant, but from the way we like to live. Our laws must be reshaped to reflect that, or we will continue to spin our wheels on ice.

Without trying to point any fingers—and that really isn't what I'm trying to do here—let me say that Congress has a critical role to play, one that may cause some changes in how it conducts its business. With a politically divided national Government it has been easy in the last 12 years to blame one another, either the Executive or Legislative Branch, for environmental problems. In the process we have caused serious damage to the credibility of our institutions and avoided the tough work of serious examination of our environmental statutes. This is not to suggest that Congress must not be responsive to the concern of its constituents; you must be, but that concern must be balanced by some deference to the agency created to help solve our environmental problems.

It is the proper role of Congress to set broad environmental goals for EPA and provide it with the necessary resources to achieve those goals. The agency must be given more discretion as to how those goals are to be achieved. Regular and informed oversight, the purpose of which is to further guide EPA in the achievement of Congressionally mandated goals, is the critical role for Congress.

Finally, the transition to a more sustainable economy is something I talk more about in my statement than here, Mr. Chairman, and it won't be easy. We have little practical experience to guide

us right now. What we need is experience born of trying to implement the principles of sustainable development with which we are all familiar.

I suggest that this committee at least consider a strong natural resource base and a small population for trying a pilot program in a State like, say, Montana—that just happens to come to mind, Mr. Chairman——

[Laughter.]

Senator BAUCUS. It meets both criteria.

[Laughter.]

Mr. RUCKELSHAUS. I don't think such an undertaking should be casual. It will take a lot of time and patience, resources, a lot of attention. I think the yields from a successful effort in a State like that—and there are others—would be of enormous benefit to the country.

The reason I suggest that we pay significant attention to this is because I think the stakes are so huge, just as I believe we could not have fostered the near-miraculous rebirth of liberty that we have observed throughout the world in recent years had our prosperity and democratic institutions not served as examples; so we will not be able to foster the appropriate environmental behavior throughout the world as long as our environmental institutions are in their current condition. So I think it's terribly important that we pay attention to these issues.

Again, I appreciate your invitation to appear this morning.

Senator BAUCUS. That is very interesting. I appreciate that very much, Mr. Ruckelshaus.

Next, Mr. David Buzzelli, who is one of the cochairmen of the President's Council on Sustainable Development.

Mr. Buzzelli?

STATEMENT OF DAVID T. BUZZELLI, VICE PRESIDENT, ENVIRONMENT, HEALTH AND SAFETY AND PUBLIC AFFAIRS, THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN; AND COCHAIRMAN, PRESIDENT'S COUNCIL ON SUSTAINABLE DEVELOPMENT

Mr. BUZZELLI. Thank you, Mr. Chairman, for inviting me. I am Dave Buzzelli, Vice President of Environment, Health and Safety for Dow Chemical. I am here today with Jonathan Lash, the President of the World Resources Institute, who is my other co-chair on the President's Council on Sustainable Development.

Jonathan and I applaud the committee's foresight in looking for new directions in environmental policies. Public opinion is indicating that there is a growing recognition that there can be no environmental reform without economic development, and no economic development without environmental reform. This, for me, is the basis of sustainable development, a concept which encourages development that meets the needs of the present without compromising the needs of the future.

I am a strong believer in and a long supporter of sustainable development. I have worked for Dow Chemical for nearly 30 years and understand well the need for sustainable development.

What does sustainable development mean to a company like Dow Chemical? Quite frankly, it represents an opportunity for us. It

represents an opportunity to improve our environment, health, and safety performance. It represents an opportunity to reach out to stakeholders and to build new, constructive partnerships, which we haven't had before. And finally, it represents a business opportunity. It represents an opportunity to develop new products and new processes and enter into new businesses that will give us a competitive edge.

We can also look to our northern neighbor, Canada, to see how sustainable development and a partnership approach can be successful. The National Task Force on the Economy and Environment was Canada's response to the Brundtland Commission's findings, which included establishing 10 roundtables in Canada to develop strategies on sustainable development. I had the good fortune of being a charter member of both the National and the Ontario Roundtables, and I have seen the tremendous potential of using this roundtable principle. In the United States, the Global Tomorrow Coalition has promoted national and regional roundtables and has actually hosted two summit meetings here in Washington in 1991 and 1992. And last year, Stephan Schmidheiny's Business Council for Sustainable Development, of which Dow's Frank Popoff is a member, issued a report at the Earth Summit called "Changing Course." It calls for the harmonization of environmental and industrial policies.

What we've learned is that sustainable development is not a simple solution and it is not a silver bullet in addressing environmental issues. We are all familiar with some of the political challenges that arise regarding environmental policy. They include pitting jobs against the environment; assuring competitiveness of U.S. industry; trade agreements; and integrating trade and environmental issues, just to name a few.

It is clear to me that improving our regulatory climate is crucial, and I would like to offer six suggestions for your consideration.

First, while the command and control approach, as Mr. Ruckelshaus said, was effective in the 1970's, we have largely outgrown it. Instead, we need to free our technology from regulatory straitjackets to provide innovative solutions.

Second, if we are to achieve a sustainable environment and economy, we have to improve our decision-making process. The key is to use consensus-based decision-making early in the process, listening carefully and adopting the best concepts of all stakeholders.

Third, we need to encourage and actively promote voluntary initiatives, and whenever possible, implement through multi-stakeholder partnerships. They won't replace regulation, but they can certainly augment it in a very, very positive way.

Fourth, we should rely more on marketplace initiatives to achieve regulatory ends. We need to develop systems that allow business to focus on environmental opportunities rather than exclusively on environmental problems.

Fifth, while there are problems that must not be ignored, we need to husband our limited resources carefully by establishing a short list of priorities. By focusing on a few, we can accomplish more. With this first short list achieved, then we can move to a second tier of priorities.

Finally, we should provide incentives to develop and install environmental technology. This will enable acceleration of cost-effective pollution prevention rather than the negative return on investment which is being spent today in end-of-pipe treatment.

To me, overriding the entire process is a fundamental question. That question is, will we evolve from the command and control "good guy, bad guy" mechanisms to bring industry, government, and environmental interests together to develop consensus-based policies?

I believe we're on the right course. In fact, I will tell you that I've never been more optimistic about our future. As an aside, I couldn't help but think that today, many, many business leaders would be glad to say what Russ Train said in his opening statement and have their names on his paper, including myself. I don't think that would have happened 15 or 20 years ago; that in itself at least leaves me in a position of being optimistic.

I have seen first-hand what happens when environmental interests, business, and Government work together. We have numerous examples of cooperation, of market incentives that foster environmental progress. I am very enthusiastic about the new President's Council on Sustainable Development. This is a unique partnership that combines the resources of industry, Government, and nongovernmental organizations to really focus on the greater good of the country.

My vision for the President's Council is to convert sustainable development concepts into tangible strategies and actions. Sustainable development is a road map that guides us on a journey to becoming more meaningful contributors in developing solutions to the environmental challenges we face.

Thank you very much, and I am pleased to be here with my cochair, Jonathan Lash.

Senator BAUCUS. Thank you, Mr. Buzzelli.

That's a good introduction for you, Mr. Lash.

STATEMENT OF JONATHAN LASH, PRESIDENT, WORLD RESOURCES INSTITUTE; AND COCHAIRMAN, PRESIDENT'S COUNCIL ON SUSTAINABLE DEVELOPMENT

Mr. LASH. Thank you, Mr. Chairman, members of the committee. I am Jonathan Lash, President of the World Resources Institute. WRI is a Washington-based policy research center, working on global development, economic, and environmental issues.

When President Clinton created the Council on Sustainable Development, composed of members of his Cabinet and representatives of the conservation, civil rights, labor and industrial communities, he gave us the opportunity to act on what I perceive to be our shared belief, that good economic policy protects the environment and good environmental policy strengthens the economy. Our mandate is to create a vision of sustainable development for the United States and a concrete strategy to achieve it. As Dave said, we are committed to developing both tangible examples of sustainable development and specific policy recommendations.

In the process, because of the nature of the Council, we can help to change the way that national environmental policy is made,

from confrontation to partnership, from gridlock to progress. The Council is the right group at the right time.

Environmental policy in the United States, as Bill Ruckelshaus pointed out, has been anecdotal. It has evolved law by law and regulation by regulation. It has somewhat arbitrarily separated pollution of the air from pollution of the water or the land. It has stressed cleanup rather than prevention. As a result, environmental programs often conflict with one another. We have never defined a clear set of national environmental goals or a coherent national strategy to achieve them. A consensus around a set of national goals will help to assure that we do not, as a colleague of mine, Rob Stavens, put it, "build fast trains at the wrong station."

It does not make sense to limit discussion of environmental policy to EPA's regulatory programs, or the discussion of agricultural policy to commodity pricing. the President's Council on Sustainable Development provides an absolutely unique opportunity to bring together interrelated issues in a single policy forum, to discuss energy policy, agricultural policy, transportation policy, and the environment together.

Worldwide, some 80 countries have established sustainable development commissions since last summer's Earth Summit. All have been organized to develop national sustainable development plans consistent with the commitments made by world leaders in Rio. At least three countries—Australia, Canada, and The Netherlands—have already concluded similar and very successful efforts which led to significant changes in national environmental and developmental policies, and significant changes in the politics of environmental policies within those countries.

One indication of the speed with which environmental issues are moving on a global level is to consider the more than 100 mutilatral environmental treaties negotiated over the last 20 years—from the 1973 *Convention on International Trade in Endangered Species* to the 1987 *Montreal Protocol* to the biodiversity and climate change convention signed at the Earth Summit in Rio last June. The nations of the world are clearly becoming ever more adept at reaching sufficient agreement to formulate global strategy in this area.

As you know, Mr. Chairman, the council comprises 25 members: CEOs from private industry and environmental organizations, members of the President's Cabinet, and individuals representing community and citizen organizations, labor, and State government. We are limited by our charter to 25 members and cannot possibly represent the broad range of individuals and institutions interested in the issues of sustainable development that we will address. We have already received a flood of expressions of interest and offers to help, and intend to involve individuals around the country in our efforts.

Dave and I are fully committed to seeking the broadest possible representation of all communities interested in sustainable development, both through public hearings and on the committees or task forces that will be formed by the council. We will instruct PCSD staff to make sure that the council hears views from all of those outside the Beltway who are interested. We will be persistent, and I hope innovative, in searching for ways to involve the

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public in our debate over environmental goals and strategies. I think the only way that we can achieve the goal that has really been stated by each of our panelists—to develop overarching national policy—is if we have a full-scale public debate on those goals.

All of the council's meetings will be open to the public. Advance notice will appear in The Federal Register and through other channels. In particular, Mr. Chairman, we are eager to hear from and to involve Congress. Dave and I especially want to meet with Members of Congress who have a strong interest in and views on sustainable development. We will try to arrange such meetings following the first council meeting on July 20th. We are particularly pleased that you have given us this first opportunity today to talk about the council. Further, we are exploring offers of assistance by the Environmental and Energy Study Institute to organize and host dinner meetings with Members of Congress and the council on issues of mutual interest. Global Legislators Organization for a Balanced Environment (GLOBE), is also arranging luncheons to brief Congressional staff. We welcome the involvement of members of this and other Congressional committees and look forward to hearing Members' views.

As I mentioned, the council will meet for the first time on Tuesday, July 20th, here in Washington. I have attached a copy of the agenda to my full statement. (P. 289.) As it shows, the primary objective is to begin to discuss which issues the council will address and which projects we will undertake, as well as how to structure those efforts so as to include as many interests as possible.

Thank you very much, Mr. Chairman, for the opportunity to appear, and I hope we can have a full discussion of what the council will do in the future.

Senator BAUCUS. I appreciate that very much, Mr. Lash.

I am now going to set up a little bit different system for the benefit of witnesses and the Senators. I am going to use the timer to allocate myself and each of the Senators seven minutes, but also encourage Senators to jump in when other Senators are asking questions. I'm trying to make this as free-wheeling and as much a search for the truth as we possibly can, and I think that structure might be beneficial.

Senator Durenberger?

Senator DURENBERGER. Mr. Chairman, I have a series of truth searches, but I have to go do a radio show in just a few minutes. Are you going to be going back and forth here?

Senator BAUCUS. Are you going to be truthful?

Senator DURENBERGER. Oh, yes. But I hope to get back about 10 minutes after 11:00.

Senator BAUCUS. Sure, fine. So what would you like?

Senator DURENBERGER. I just want you to know that I'm going to leave, and that I will be back.

Senator BAUCUS. Very good. We'll be waiting for you.

I would like to begin by first addressing what has worked in our nine environmental statues over roughly the last 20-some years. Which statutes have worked the best? Which environmental problems have been basically addressed and solved?

Some suggest that maybe the Clean Water Act has worked relatively well, and some say there are some real problems with Super-

fund, and I am one who does. But which environmental statutes have worked?

I think it is important first to start out with what has worked before getting into what hasn't worked, because I think there are probably some lessons learned from what's worked. So I would like to ask all of you, and whoever wants to speak first, go ahead. You can talk among yourselves and let's see if we can achieve some kind of consensus.

Mr. RUCKELSHAUS. Why don't I try to start, Mr. Chairman, since I was the first Administrator and I started most of the problems that we have now.

[Laughter.]

Mr. RUCKELSHAUS. I think there are portions of all the laws that have worked. I don't think you can say that any given law is a complete failure or a complete success. For instance, I think the efforts under the Clean Air Act to regulate pollution from mobile sources has been a big success. Some of the achievements in terms of reduction of carbon monoxide were mentioned in your opening statement.

I think there are reasons for that. I can give you an example. In my first tenure at EPA, I spent about 45 percent of my time on automobile pollution issues. During the second tenure, 10 years later, I spent about 5 percent of my time on that. I think that was really a result of a lot of progress having been made in controlling those sources of air pollution.

We had a very concentrated industry with strong foreign competition, as we have seen; a lot of competition, both domestically and internationally, to both manufacture and sell automobiles that were of very high quality. But this competition, when translated into competition to achieve the emission standards that were set, both by Congress and by the administration, or by EPA, resulted in significant progress in controlling what is obviously a very diffuse pollution source when you take all the mobile sources throughout the country. But the industry itself was very concentrated and very competitive, and the standards and regimes we set up were well situated to deal with that problem. In fact, that problem really stimulated the Clean Air Act, much more so than stationary sources of pollution did, which is one reason why I think we have had more success there because we paid more attention to that problem in the act, in the deliberations of the congressional hearings, and in the press.

I think we have made less progress against some of the stationary sources. In some respects, it is a tougher problem, particularly when you have issues like acid rain, global warming—and the science is still evolving in issues like global warming, so it is even tougher yet.

In the Clean Water Act, again, I think we have had some real successes in municipal sewage treatment. The levels of treatment of our sewage in this country are considerably higher than they were when all this started back in the 1970's. We have seen, by the same token, controls on large, stationary sources of water pollution, controlled to a very high level. Those are not over. In my view, in the environment, the minute you say "we've solved this problem," you're going to start losing ground again. It's not like

putting out a fire or even building a highway. You have to stay everlastingly at it or you begin to slide backward. But I think we have made real progress in point source pollution, particularly in municipal sewage treatment.

In nonpoint source pollution we have a long way to go. We're just scratching the surface.

Senator BAUCUS. Anyone else? What's worked?

Mr. BUZZELLI. I think something unusual that has worked, that I certainly don't think I would have anticipated, the reporting requirements of SARA Title III.

Senator BAUCUS. Right.

Mr. BUZZELLI. In my opinion, it has probably had the biggest single impact in the last 10 years on the manufacturing practices, just simply the reporting requirements by themselves, which is unusual. We don't see this kind of regulation anywhere else in the world where we operate. It's been very successful.

Senator BAUCUS. OK, so that has worked. Anyone else? Mr. Train, what's worked?

Mr. TRAIN. Well, I think they have already been pretty well noted. I guess I have been focussing on the ones that really are not working so well.

Senator BAUCUS. We're going to get to that.

Mr. TRAIN. We have made tremendous progress, and I am glad that in your opening remarks you emphasized this, Mr. Chairman, as Bill Ruckelshaus did in his remarks. But we've made an awful lot of progress in all of the areas. When we move around the world and see the level of environmental effort in most of the countries, we can be extremely proud of what's been accomplished.

Senator BAUCUS. I see my time has almost expired.

Do you have more samples of what has worked, before I turn to Mr. Lash?

Mr. TRAIN. No, I do not.

Senator BAUCUS. OK.

Mr. Lash?

Mr. LASH. Congress initiated a very interesting structural experiment when it began to pass the Clean Water Act and the Clean Air Act, which was the relationship between EPA and the States, setting national policy and national strategies and giving the States the opportunity to implement those policies. That has been difficult to put into effect, but I think it has been uniquely successful. I think it is enormously important to have local implementation of the laws. It has worked, despite the difficulties of building that relationship.

Senator BAUCUS. Thank you.

Senator Kempthorne?

Senator KEMPTHORNE. Mr. Chairman, thank you very much.

I certainly think it is an impressive panel. Let me step back, in continuing this type of dialog, and perhaps ask a philosophical question first.

First, I will state that I am a new member of this committee. If you were a new member of this committee, what would you be doing? What would be some of the first things you would approach? Or what would your attitude be as you began to deliberate on this entire issue of the environment?

Mr. RUCKELSHAUS. I think, Senator, you are in a unique position of not being wedded either psychologically or in any other way to what we have tried in the past. It's not your fault, what has happened; it's probably more my fault and Mr. Train's than anybody else. That isn't to suggest, as I think the Chairman's question was aimed at ferreting out, that we have made no progress. That would be a terrible thing to conclude; in fact, we have made a lot of progress in the last 20 years. What we now need to do is take a new look at what we're doing with fresh eyes. Your eyes are fresh; they are not encumbered by any weddedness to the past, and that gives you a tremendous advantage. There are some big-time problems that we have to deal with, like Superfund. We have global issues. We have the whole question of sustainable development, which this hearing is aimed at giving some illumination to, and how do we make sustainable development a reality in this country? What are the legislative roles that need to be played? Certainly, that's an issue that Mr. Buzzelli's and Mr. Lash's council should be addressing, and I know they intend to, but I think there are things that the Congress can do to make sustainable development move from rhetoric to reality, which we very much need to do.

Senator KEMPTHORNE. I appreciate that.

Mr. Buzzelli?

Mr. BUZZELLI. Senator, if I were a new member of this committee, I would take an approach that might be unique.

If we're going to change the kind of decisions that we're going to make, we're going to have to do it through a disparate decision-making process than what we've had. Our decision-making process on environmental policy in this country has been largely adversarial up until now, and it served a point. If I were in your shoes, I would sit back and think about the decision-making processes that we have so that we can improve the decisions.

Senator KEMPTHORNE. Could you just expand that a little bit? How would you create a different decision making process?

Mr. BUZZELLI. Well, I think the President's Council is one attempt to do that. It's an attempt to bring a consensus view together rather than a separate view.

I had a rare opportunity—at least for me—I had a chance to live in Canada for five years. I just returned three years ago. I ran our company in Canada. There are lots of good and bad things about living in a foreign country. One thing it does give you is an opportunity to stand back and look at your own country through a different set of eyes, and to look at somebody else's.

One of the things I was absolutely——

Senator BAUCUS. What country was that?

Mr. BUZZELLI. Canada.

Senator BAUCUS. Thank you.

Mr. BUZZELLI. One of the things by which I was absolutely struck in Canada was the movement to a very participative, but not adversarial, decision-making process on major environmental policy. While I was there, they passed the Workplace Act, which was equivalent to OSHA. They passed the Canadian Environmental Protection Act. They passed the equivalent of our TRI, and all of it was done with industry, environmentalists, and government working together and coming forward with a recommended solution. It

struck me as a different way of making a decision than we use. That's one example.

Senator KEMPTHORNE. All right, thank you very much.

Mr. TRAIN. Let me add onto what Dave just said.

My experience with Canada, and perhaps other parliamen- tary systems, is that in legislating in fairly complex areas, the legislation tends to be a lot simpler than what we enact. This is along the lines of what Bill Ruckelshaus was saying in his remarks earlier. Far more discretion is left to the executive agencies responsible. And I think that kind of system tends to be more open to the sort of consensus approach than perhaps our way of going about it, giving the Administrator of EPA very little discretion and opening him, one way or the other, to lawsuits.

Senator BAUCUS. Isn't the difference really our form of Government?

Mr. TRAIN. It has a great deal to do with it.

Senator BAUCUS. We are a Constitutional form of Government. We are a nonparliamentary form of Government, with separation of powers, and it makes it very easy for someone—of course, our statutes create broad standing, but it is very easy for someone under a very broad standing statute to file a lawsuit if he or she disagrees with the decision that the Executive Branch has made. That seems to be a large part of it.

In addition to that, there is much less contention in parliamentary countries between the executive and the legislative branch because it is the same. Obviously when it is the same, in the press, anyway, there tends to be less controversy, although the minority party is somewhat more critical, but they have no power.

I think largely that the answer to why we're so litigious and why there are so many lawyers in this country is basically the form of Government that we have.

Mr. RUCKELSHAUS. Well, I think that's at least partially true. On the other hand, it is also true that Congress can shape the kind of decisions that the courts ought to be reviewing. What we've done in many of our environmental statutes is invite the courts in to make these judgments; not just to look at the arbitrary and capricious kinds of decisions made on the part of the Executive Branch, but to review at virtually every level the kinds of decisions that are made in the courts. And just as the Congress has invited the courts into a lot of areas, they can invite them out. They can say, "These are decisions we think should be left to the Executive Branch," and much more strictly prescribe the kinds of things that are judicially reviewable.

In my view, a lot of those issues should be reviewed by the Congress in its oversight capability and responsibility as opposed to leaving it to the courts. I looked at how fast Canada can move on environmental issues versus the speed with which we can move. I don't think the environment is any worse off because Canada moves faster; in fact, I think quite the contrary is often true, yet they can make these decisions in a fraction of the time we can because we have this very cumbersome procedure that leads us through the courts.

I think it is hurting us competitively, and I think ultimately it hurts us environmentally.

Senator BAUCUS. I'm just not much of a student of Canada's judicial system. Maybe some of you can enlighten us. Maybe you, Mr. Buzzelli, since you spent some time in Canada. Once the Parliament passes an environmental statute, is it as reviewable? Is there as much standing to sue in Canada as there would be if Congress were to pass the same statute word-for-word, the same statute?

Mr. BUZZELLI. No. You're absolutely right, Senator, the judicial systems are very different. But before we start saying it's a different form of government, and therefore we can't adopt it——

Senator BAUCUS. No, I'm not saying we can't adopt it. I'm just trying to understand the differences.

Mr. BUZZELLI. —I think there are a couple of lessons.

When I first went to Canada there really hadn't been much consensus-building in the environmental area. An organization called the Niagara Institute started the process in Canada of getting labor, business, the environmental movement, and government to sit together and begin to hammer out some solutions together. The Niagara process now has spun off into a Canadian government process.

So although what you're saying is true, it hasn't always been true in Canada that it has been easier to make environmental choices.

Now, let me not get into a pro-Canada thing. There are some terrible things about their environmental policy. One of them—and I think Jonathan Lash mentioned it—is that in the United States, the EPA has the authority and grants the authority to the States. One of the problems in Canada is that each Province of Canada can pass its own environmental regulation, and from the standpoint of doing business in Canada, at times it's like doing business in 10 different countries within the country. And that isn't the way we should go.

Senator BAUCUS. I would like to know what hasn't worked; to flesh out with as much precision as possible the categories of present problems. One is the nine statutes that aren't integrated; you mentioned that, Mr. Ruckelshaus. That's certainly one problem. Another one is the 50 committees of Congress that EPA and other environmental decision makers in the Government have to report to. Another basic one is the lack of focus on sustainable development.

I suppose we could get into coordination of environmental and economic policy in this country with that of others, because obviously as the world gets smaller and our economies and our world environment is more integrated, those are just issues on which we have to focus more.

Could anyone take a shot at this, to delineate what hasn't worked so we can begin to get a handle on that in order to get to the next step; how we begin to solve some of this?

Mr. LASH. I would just make an observation about some things that have already been said.

It is interesting that the statute that seems to be working worst is the one most clearly designed only for a cleanup mission of past problems, and one of the statutes that seems to be working best is one that is clearly oriented toward prevention, SARA Title III disclosures.

Now, you can make a lot of observations; they are very different statutes and so forth, but so much of what we have done in the last 20 years has been oriented toward identifying a specific problem and a specific medium and trying to clean up that problem without looking holistically at a complete system, that I think it has been very difficult to implement it in a way that made sense on a larger scale.

Senator BAUCUS. Anyone else? What's not working?

Mr. BUZZELLI. From my standpoint, one of the things that we could improve upon significantly is really trying to focus on some priorities. I know that politically it isn't a popular thing to say, because everybody's problem needs to be important to us, but the fact is that we have fragmented a lot of our effort. When I look at the time and energy we spent in our company on improvements that are relatively minor compared to areas that we're missing the opportunity to improve upon because we're pushed into a specific area of having to do something, we haven't done a very good job of standing back and really saying, overall, "What are the priorities we're after and how can we focus on them?"

Where that has happened, incidentally, where we have tried some innovation, is that it has been remarkably successful. I think the voluntary TRI-33/50 program, where you now have almost 1,100 companies in this country that have agreed to reduce their emissions by 50 percent—when I tell the German Minister for the Environment about that, he can't believe me, that 1,100 companies would voluntarily come forward.

So one of the things we haven't done very well is pulling this voluntary action into our mix and asking people, "What can you do? And what will you do?" Because when that happens, quite frankly, it becomes a voluntary standard of performance for industry, whether they like it or not. It is a standard; it just happens to be a voluntary standard.

Senator BAUCUS. If you were the Congress and/or the President, what would your priorities be?

Mr. BUZZELLI. My first priority, I think, would be to focus more on where we really are in the area of health effects on the environment, and on environmental effects. We have moved away from that. We started out in the area of looking at the ultimate impact of what we were doing, and today we've moved a bit away from that. We've moved away from specific effects and more toward a continual reduction program.

The other area that I would rapidly move away from and take off of my priority list is the absolutely overburdening reporting requirements that are coming forward in new regulations. In the new Clean Air Act, just one portion of the act—the Hahn rule—is crippling from the standpoint of reporting requirements. At each one of our plants it is now estimated it's going to take three man years of effort continuously to meet the reporting requirements of the Hahn rule.

Senator BAUCUS. I'm sorry, which rule?

Mr. BUZZELLI. The Hahn rule, under NISHAP. That happens to be 6 percent of the manpower of our Michigan manufacturing operation that is going to have to go to reporting requirements for one portion of the Clean Air Act. We have to move away from and take

off of our priority list this terrific recordkeeping burden, to free people to get the job done.

Senator BAUCUS. Very briefly, what would other priorities be? And would you agree or disagree with Mr. Buzzelli, anyone?

Mr. RUCKELSHAUS. I don't necessarily disagree. I guess my sense is that one of the big problems our country has, and it's well focussed on the environment, is the issue of trust in Government. We've all seen these surveys about how people's trust in the fundamental institutions of our society is eroding, and I think that's a terrible problem for us.

Mr. Lash is chairman of a commission that we both sit on, looking at the issue of Superfund. Our commission has seen citizens living around Superfund sites who are as angry as any group of people that I've run into since the Vietnam War. They are as alienated and upset with Government—they are dealing with a process that they can't comprehend or understand that is not making any progress against their major problems. Who they primarily blame is EPA, by the way. They think EPA is the epicenter of all of their problems.

My view would be to do something counter intuitive, and that is to give EPA more power, not less, a broader grant of authority, but in giving them the responsibility, make sure that they have the resources and the power to carry that responsibility out. In the case of Superfund they simply don't have it in the sense that it allows them to relate successfully to these people.

Now, part of it is EPA's problem. It isn't something that Congress can correct just by a wave of the pen. But giving the EPA Administrator sufficient discretion to deal with that kind of problem as it exists in the vast variety of these sites that exist across the country——

Senator BAUCUS. My time is up.

Before I leave, I'll bet, a lot of people would shudder at hearing that EPA is going to be given a lot more power.

Mr. RUCKELSHAUS. No doubt about it.

Senator BAUCUS. And second, a lot of business people tell us that they abhor uncertainty, and giving EPA a lot more power, and particularly a lot more flexibility, could create a lot more uncertainty.

Mr. RUCKELSHAUS. Not any more than they have now.

Senator BAUCUS. So how do we give them more power and more flexibility and increase volunteerism and increase more business trust?

Mr. TRAIN. I think it would get you more volunteerism.

Senator BAUCUS. Sorry?

Mr. TRAIN. I think it would get you more volunteerism. I think at the present time the EPA frequently feels handcuffed in terms of trying to promote voluntary approaches.

Senator BAUCUS. I think that's true in a lot of respects.

Let me ask Mr. Lash: do you agree or disagree?

Mr. LASH. I actually wanted to go back to the question of priorities.

Senator BAUCUS. All right. That one first.

Mr. LASH. I hope to be back to you in January with the results of this commission process, and I hope we'll have some strong recommendations for you.

But I wanted to mention a standard for setting priorities that was proposed by the group of scientists and ecologists I worked with in developing a report for EPA, "Reducing Risk," which was an effort to do some prioritization for EPA. In struggling with this question, which is enormously difficult and reflects one's personal values about what is important, the ecologists proposed that the crucial considerations are space and time. In looking at an environmental problem you have to consider how broad an area is affected by that problem and how long a time it will continue to affect the environment. If it is a problem that can be rectified relatively quickly, it's less significant; if it is one that, once it is in place, it will be almost impossible to change for a very long time, it is more significant.

Applying that standard, you absolutely have to consider global climate change as a priority. Whatever the uncertainties are, we know enough to be concerned. We know enough to begin to pursue the "no regrets" policies that are available to us, and that would be a very high priority.

Senator BAUCUS. Thank you. What about Mr. Ruckelshaus' suggestion about more power and more flexibility at EPA, Mr. Lash? I would like your reaction to that, please.

Mr. LASH. Well, I've heard the same things that he has during the process that we've been going through. There certainly is a clear sense that as it is functioning now the agency is handcuffed and responding in a way that is so rigid that it doesn't satisfy any of the interests that are concerned.

We have to find some way to enable the agency to be responsive to all of the interests, all of the stakeholders in this process.

I'm being a little bit ambiguous here because I want to make sure that I don't represent that this is any conclusion of the commission, since the commission has not reached any conclusion yet.

Senator BAUCUS. I'm asking for your personal opinion.

Mr. LASH. I do personally feel that we're going to have to make changes in the act and we're going to have to build in enough flexibility for EPA to do what makes sense at sites, and then build in a process that enables all of the affected players to have an input on those decisions.

Senator BAUCUS. Senator Kempthorne?

Senator KEMPTHORNE. Thank you, Mr. Chairman.

I would like to follow up on something with regard to this commission. I think Mr. Lash and Mr. Buzzelli probably make very effective cochairs of that.

I'd like to just get your thoughts, Mr. Buzzelli and Mr. Lash, and the others can certainly jump in, but one of my concerns—I consider myself a pro-business environmentalist, because our environment is our life support system. And yet, when I drive by some of these buildings that are filled with EPA regulators, writing the rules and regulations, and I see a law that we have passed, but then I see what the regulations are, and I know that in my State—and I think in Montana—the ranchers, the farmers, the different entities that have been trying to derive a living for generations off the land wonder if those regulators really have any concerns for them, out there on the land.

How do we draw them together so that we do find that—the word "balance" comes to mind. Do you really think we're making progress to have the entities find that common ground?

Mr. BUZZELLI. In my view, we're beginning to make some progress. It wasn't too many years ago where people from industry really viewed the people from EPA as the enemy, and I'm being very candid with you. I think today you'll find a growing number of business people don't have that view. They understand the frustration that some of the people in the agency have. They also understand some of the limitations that they have in terms of their own personal knowledge of what is happening out in your State or mine.

So I think there's at least a sense that the good guy/bad guy "I'm at war with you" between business and the EPA, in my opinion, is changing. Now, where is it on the scale of change from 1 to 10? It may only be at a 2 or a 3, but at least it's not a zero.

In many, many respects, many of the folks within the agency that I deal with are very, very competent people, but they have been brought up in an atmosphere of regulation, period, and sometimes the ability to sit back and take a look at an overall problem and try to understand the problem a little bit better is limited. I was just commenting with some of our people the other day; we were talking about RCRA, and one of our people made the comment to me that our RCRA inspections of our facilities had changed entirely. In the early days of RCRA, inspectors used to come out and look at what we were doing. Now they come and look at the records that we have. They're not looking at what we're doing anymore, and I think that's a challenge for us.

Senator KEMPTHORNE. Why has that changed?

Mr. BUZZELLI. I can't answer the question. It's an observation on our part, Senator, but I just don't know the answer as to why it's changed. I suspect that some of the regulations are more heavily oriented toward reporting requirements than they ever have been. I suspect that may be one of the reasons, but I don't have a good answer for it.

Senator KEMPTHORNE. That would be consistent, too, with what I've heard out in my State, and that is the number of small operations that now have one employee dedicated solely to keeping the records. It really puts a financial burden on them.

This last week, out in the State, I rode around for a while with one of the logging truckdriver; he's a second-generation logging truckdriver, and he said, "I know there's no future for my 16-year-old son in this business any longer, so I'm encouraging him to look elsewhere." But in the cab of this truck is this picture of this 16-year-old with a beautiful big fish, that he's caught, and his father then goes on about how much they love this land, they want to make sure that water is clean, that the fish are there. He's an environmentalist and he's trying to derive a living from that land.

I just hope we can ultimately get to that point that the finger-pointing will stop and we can have some trust. I think that's the goal of all of us.

If I may, let me ask all of you—maybe you could help me with this, Mr. Ruckelshaus—the National Environmental Policy Act, NEPA, allowing us to weigh all of the Federal decisions that we

make and what the outcome may be, and encouraging public participation in that process. And yet I get a real strong sense from input that I receive that there is concern that perhaps NEPA, the process, is getting out of hand, the fact that an environmental impact statement may take years to complete and millions of dollars.

So my question is, does NEPA need to have some refinement? And if so, what sort of refinement, so that we perhaps don't have such an economic drag on the system as we try to accomplish the NEPA objectives? I think Americans support NEPA's objectives.

Mr. RUCKELSHAUS. Well, NEPA gets a lot of blame for a lot of different problems. In fact, when Train was chairman of the Council on Environmental Quality he was the first person to try to implement NEPA; in fact, NEPA created the Council on Environmental Quality, and it was his responsibility to implement it.

I guess my own view is——

Mr. TRAIN. Don't try to shift the blame to me.

[Laughter.]

Mr. RUCKELSHAUS. Right. All I did was comment on it; he implemented it.

My view about NEPA is that while it is cumbersome and it is frustrating to a lot of people who go through it—and, again in my view, its application is something like this NAFTA; whether the judge is right in his interpretation of the law, I believe it's a bad public policy to have that sort of requirement placed on a trade agreement—but I think one of the reasons this country is in a position to show the rest of the world what sustainable development means is because we have been for literally two decades now been reviewing a number of our economic decisions against their environmental impact because of the requirements of NEPA. And I think that experience that we've gained from that is invaluable to us in being able to finally describe what sustainable development is all about.

I do think it can be streamlined. I think there can be ways of accomplishing the same result in the same time and in a less cumbersome way, and that probably takes some statutory change if that's going to happen.

Senator KEMPTHORNE. Any other comments on NEPA and whether there is need for change with it, or change to it? Mr. Lash?

Mr. LASH. My experience with NEPA is that the process becomes most cumbersome when it is not initiated effectively and in good faith early; that is, if there is a project for which a full EIS is not done and later there is litigation, and then you have to go back and do an EIS, that is a long and expensive and difficult process that will probably be the subject of repeated litigation. The key to having it be a relatively easy and constructive process, one which in fact makes for better decisions, is to have agencies choose to implement it early and make it a part of their initial decision process rather than something they paste on at the end of the decision process.

So the more that we can incorporate it in the normal decision making process rather than having it a separate burden at the end, I think the less burdensome and more effective it will be.

Senator KEMPTHORNE. Mr. Chairman, thank you.

Senator BAUCUS. Thank you, Senator Kempthorne.

Senator Durenberger?

Senator DURENBERGER. Thanks, Mr. Chairman.

May I begin with Mr. Lash and ask if you've met personally with President Clinton about the charge to the council? And could you tell us what he said to you?

Mr. LASH. We met with the President only very briefly before the Rose Garden ceremony, and mostly we exchanged pleasantries. There is an Executive Order that has been signed and a charter that I understand will soon be filed that define our charge in terms of advising the President on environmental goals and strategies, and in particular on a sustainable development action plan.

Senator DURENBERGER. Do you have a meeting scheduled with him, or anything like that?

Mr. LASH. We do not, no.

Senator DURENBERGER. I watched him yesterday with Senators and Congressmen involved with the floods and so forth, and actually when the House members went on a break, he was standing there with the back of an envelope; somebody would come up for a photo op or something, and he was writing this stuff down on an envelope. So you kind of know how strongly he feels about some of these things.

But at least in Minnesota there is also the feeling that Al Gore does the environment and Bill Clinton does other stuff.

Mr. LASH. That is not my impression of this commission. I believe Senator Baucus was present at that ceremony when the President announced it, and he gave a very strong speech explaining why he thought that bringing together these two strands of policy, economic and environmental policy, was crucial.

Senator DURENBERGER. Well, that's the President Clinton that I think I know, too, even from being a Governor. But I just needed to ask you.

Second, I want to ask Russ Train and maybe some of the others of you to talk a little bit about trends in our society that aren't sustainable, but maybe an observation by way of background is appropriate.

In my experience we really don't ask EPA to deal with big issues. There really is little chance that we're going to convert them into a "big issue" agency. And the kinds of things that some of us deal with in other committees—trade, tax, commerce, agriculture, population growth, transportation, and so forth—seem to be, at least to us and I think to the Nation, too important to give to EPA.

So part of my question is how do we, as policymakers, deal with these relationships? Mr. Train, maybe we can begin with your personal observations about those trends in our society that aren't sustainable, then talk a little bit about what our role might be in dealing with these intersecting policies.

Mr. TRAIN. Well, Senator, I referred in my summary remarks to a variety of examples of nonsustainable behavior, and I referred, maybe in more detail than on anything else, to the gasoline use problem.

We talked about things that don't work or that don't work very well, and I think we can all agree that the Clean Air Act has brought about remarkable progress in air quality in many sectors. Bill Ruckelshaus specifically referred to progress that has been made in dealing with automobile emissions, and I would agree with that. I would also add that during my time as EPA Administrator following him, I also spent a great deal of time on auto emissions.

But it seems to me that we have moved about as far as we can in trying to control emissions to achieve air quality improvement. I think this is characteristic of a number of our statutes. They've really done quite well, particularly in terms of their original purposes. I think that how much further they can drive the system is open to question, and that is why in the report of our National Commission on the Environment we emphasize trying to move away—I don't think you eliminate command and control regulation—but trying to move into a new area of incentives and disincentives to accomplish more environmental cleanup, at the least cost.

Senator DURENBERGER. I'm just trying to get at how this gets done, and maybe between the two of you, you can react to this. My premise is, we have a command and control system with regard specifically to carbon dioxide emissions and CAFE standards. And as you're pointing out, maybe that's gone about as far as we can, and my assumption is—maybe you suggested it—we ought to replace that with a dollar tax. Well, you've just heard in the last couple of months what the chairman of this committee thinks about gasoline taxes, in a different capacity, not necessarily as chairman of this committee, but down two levels, in the Finance Committee. I don't want to speak for my new colleague from Idaho, but he certainly represents the wide open spaces, and I'm not sure he's going to be real hot for a dollar tax.

So my question is this. OK, let's accept that a certain amount of command and control works; we've got to try something else, like an incentive. Where and how do we do that? Is it an energy policy? We did a lot of energy policy in the Clean Air Act, a whole lot on reformulated gasoline and a whole lot of other things. We were doing a lot of energy policy—ethanol—in the back door of the Clean Air Act.

But there's only so far you're going to get on that, the way the process works, and then you have energy policy colliding with transportation policy, in the case of Montana, or agriculture policy or something like that, and you've got all these things coming together.

I just don't think the EPA is capable of dealing with this. How do we do it, as policymakers? Where are these things supposed to come together?

Mr. TRAIN. It seems to me that one of the institutional areas in Government that we have had in the past, but which is quite threatened at the present time, is the Council on Environmental Quality, which is charged with, and certainly could be used by the President for, looking across all of the cross-cutting issues of energy and the environment and agriculture and the environment which, frankly, is not all that easy for one agency, such as EPA, to deal with, and to address just the question you are talking about.

Frankly, though, on the automobile problem, I recognize the political difficulties involved, particularly in areas well represented here today.

Senator DURENBERGER. I should include myself, too. I have a wide open State.

Mr. TRAIN. I don't know how to bring about a change in that political situation. Obviously I can't. I would say that you all enjoy these magnificent wide-open vistas and beautiful plains and glorious mountains and wonderful fishing, and your people, in order to really enjoy that, ought to be willing to pay an increased gasoline tax.

[Laughter.]

Mr. TRAIN. Try that argument next time you go home.

[Laughter.]

Senator BAUCUS. On that note—any more questions?

Mr. RUCKELSHAUS. Let me try to respond, because I think your question is a really valid one and it's very relevant to this——

Senator BAUCUS. Well, it's basic to this inquiry.

Mr. RUCKELSHAUS. That's right, the whole sustainable development question is related to this. You can't locate all these responsibilities in one agency. No agency is big enough. You would have to put everything in there. Regardless of the question of more flexibility or power—I'm not suggesting that—what we really need to do is to make sure that these agencies—in fact, we discussed this same issue in the Brundtland Commission involving the U.N.; how do you take the United Nations Environmental Program, the UNEP, and make sure that these other development agencies of the U.N. take into account the environmental impact of what they're doing?

It's much the same kind of charge that needs to be made to other departments of Government, not how do you focus it all in one agency and then have that agency try to force them to do the right thing, but how do we make sure that Energy or Agriculture or Labor or the Commerce Department—you name it—factor in the impact on the environment in what they're doing so that when they make decisions that affect the economy, for instance, those decisions can be much more wisely made if their environmental impact is made a part of the decision making process, and it can be sustainable in both an environmental sense as well as an economic sense.

Senator BAUCUS. Isn't part of the solution here education at various levels? The more Americans understand, through education, what some of the environmental consequences are of present continued actions and vice versa, the more they understand how certain environmental actions might adversely affect the environment and jobs. We're getting at sustainable development, but the more people think more about this and have more information, the more it's going to be reflected up through the legislative process, it seems to me.

Mr. TRAIN. There's no question about that. I think we all know that our children are a good deal more environmental than we are, and we're more environmental than our parents were. It's both a generational thing and an educational thing. The two go together.

I think a major focus of a national environmental strategy is exactly what Bill has been talking about, and I think what you're

driving at, Senator, and that is how to integrate this concern for sustainable development into the programs and policies of all Government agencies. I don't overlook the private sector at all in this regard. I think a national environmental strategy, developed cooperatively between the Executive Branch and the Congress, has to include an outreach to the private sector, both in terms of education, in terms of industrial policy. I think this is where some real breakthroughs can be made.

Senator BAUCUS. With respect to energy taxes, I strongly believe that this country needs a broad-based energy tax. I have strongly supported it. I thought the President's first proposal was a good idea, with some modification and some refinement. That was because it had an energy conservation component. The gasoline tax, in my view, of four or five cents, has no conservation component. People are going to pay four or five or six or seven cents more per gallon regardless, but they're not going to base their decisions on whether or not——

Senator DURENBERGER. Like another nickel on the cigarette tax.

Senator BAUCUS. Like another nickel on the cigarette tax, although it does have an effect when you get up to a dollar a gallon. There's no doubt about that.

We also have to remember that in our country we have about three times the miles of highways and interstate highways per capita than is the case in Europe, and certainly in Japan and other countries. But the answer on energy taxes, I think, is something that is a little more broad-based than simply relying on the gasoline tax, at least in this country.

Mr. Ruckelshaus, let's say that for the third time you are the Administrator of EPA.

[Laughter.]

Senator BAUCUS. How would you begin to integrate these nine statutes? The Congress has given you full power, full flexibility.

Mr. RUCKELSHAUS. Well, I think that's a very good way to start my third term at EPA, with that kind of flexibility.

[Laughter.]

Mr. RUCKELSHAUS. I really think of it more in terms of flexibility than power.

Senator BAUCUS. What would you do?

Mr. RUCKELSHAUS. Well, in the first instance, supposing they are all put under one organic act. You would say, all right, we have a series of pollution problems in this country, and we could identify those problems either in terms of things like nonpoint source pollution, or in terms of specific pollutants that we are trying to control. If it's a specific pollutant problem, I would simply designate a task force within the agency to identify the best way to interdict that particular pollutant, and in what media, in order to maximize the benefit to the environment and minimize the cost in achieving it. What we now do is remove it from the water and put it on the land, or take it out of the air and put it on the land, and then try to figure out what to do with it after we have it on the land, declaring victory at each step along the way as we remove it. That's very wasteful of our resources and really doesn't always solve the problem.

You could do some of this now, but what is lacking is both a charge to do it and the power to do anything about it after you've identified that, because you may be forced by the statute and by the deadlines in there to deal with that pollutant in the air or the water within a certain timeframe, and you don't have the flexibility you need to deal with it across a broader spectrum. That's one thing I would do.

In terms of some of these broader kinds of problems, I would reorganize the agency around these problems and not pay so much attention to the medium structure that is now there, and organize them around specific problems so that we could devote whatever resources the agency has against the highest priorities. Those priorities, by the way, should also be set in conjunction with the Congress and with the agency professionals working very hard to identify what the biggest problems are and where we can get the biggest payoff in terms of public health or environmental protection for whatever dollars the agency is given to spend.

Senator BAUCUS. Changing gears slightly, what kinds of marketplace incentives would you recommend? There is a very important role for command and control regulation. There is a lot of talk now about moving beyond that, and I agree with moving beyond. But as we move beyond, I would like your ideas as to what kinds of marketplace initiatives make sense, and what else we do in addition to command and control to achieve this holistic agenda, as well as basically sustainable development. What kinds of non-command and control initiatives would you suggest?

Mr. RUCKELSHAUS. Well, I think you're addressing the right issue, and that is incentives. How do we get the incentives, particularly in the private sector but in the public sector as well, addressed to the goals of our environment? The market-based system is simply a way of lining up incentives with what our goals are. I think the Clean Air Act credits, creating allowances for dealing with sulfur oxides, is a good example of something that ought to be tried. There are a lot of different examples like that can be cited that have been discussed here in the Congress.

Again, I think for purposes of understanding how these incentives are going to work in the real world there needs to be sufficient flexibility for EPA to do it on a pilot basis as opposed to doing it across the whole country, because inevitably we're going to have effects that we haven't anticipated, and understanding what those effects are before we launch into a nationwide program is very wise. I know that in our own company we rarely put some big change in across the whole company. We will try it in various districts first to see how it works. That certainly is something that Congress could give more flexibility to EPA to do.

What we're really trying to do with these market-based systems is get the incentives right. If we can do that, we can make a lot more progress than we can by using just strictly command and control.

Senator BAUCUS. Is the Commission going to be addressing this, Mr. Buzzelli?

Mr. BUZZELLI. The whole area of market-based incentives? Yes. I think the commission—and they haven't met yet; they're meeting on Tuesday for the first time—but one of the areas that Jonathan

and I would like them to take a look at is this whole concept of pollution prevention. How do you motivate business and government institutions—speaking, now, about city governments—to eliminate the problem before it is a problem? Because ultimately, that seems to me to be the only logical solution. And people aren't going to do it for altruism. They ultimately are going to do it only because of an economic impact, either a current economic impact or a potential future economic impact that they're trying to avoid. That's the only reason they're going to do it. In the bottom line, it has to come down to economics.

Now, the first thing that happens is that somebody's going to say, "Well, I've got a great market incentive; let's put some environmental taxes in place," and every businessperson in this room, and I may be the only one, is going to run right out the door, saying, "Wait a minute; how can an environmental tax be a market incentive?"

I think we need to get more creative about that. I think many companies might be willing to talk about fees instead of taxes, and there is a big difference.

Senator BAUCUS. What's the difference?

Mr. BUZZELLI. Well, the tax usually ends up back in the general coffers of Government, and that leaves business very concerned because they're wondering whether the motivation will ultimately be to raise money or to correct behavior. A fee generally goes back into the same area to improve it.

Senator BAUCUS. Like permitting fees?

Mr. BUZZELLI. Like a permitting fee. We're taking a look in our own company at changing some of our internal cost structure for the environment to try to change the "voluntary," if you will, behavior of some of our plants. For example, we are looking at replacement costing for environmental disposal at our own facilities rather than actual cost. There is a big difference between the two—it's like about a factor of five. We've tried it on a pilot basis and it works.

Senator DURENBERGER. Mr. Chairman, would you yield for a question?

Senator BAUCUS. Sure.

Senator DURENBERGER. Something that Mr. Buzzelli said about economics ties in with the response that Bill Ruckelshaus gave you on EPA. I want to just ask this in the form of a question and get some kind of reaction.

Right now, it seems to me, EPA is organized by problem or by media, and yet we're talking about transportation, we're talking about agriculture, we're talking about specialty chemicals and so forth. What's wrong with thinking about organizing our environmental policy and its implementation somewhat differently, more along these major parts of our national and international economy, rather than organizing it by a specific medium?

Mr. TRAIN. Nothing is wrong with it.

Mr. BUZZELLI. There is nothing wrong with it. In fact in your earlier question, Senator, I was going to say to you that American business a few years ago got a real wakeup call, from a competitive standpoint, in many, many, many companies. They had to look deeply at their organizational structure through quality perform-

ance or quality techniques. Today many companies totally reorganized, focussed on their customer rather than their activities. They used to be focussed on activities, but now they are focussed on customers.

Possibly, some of the learning that has come out of the many reorganizations that have happened in American business could be used to look at Government, at how it operates, and how you break down the silos, because in the business world that's what it's really been all about. We call it "managing the white spaces on the organizational chart," and I think that's what you were referring to earlier.

Senator KEMPTHORNE. Mr. Chairman, if I heard Mr. Ruckelshaus correctly, too, in the area of flexibility, there may be opportunities to perhaps—I'm putting it in my own terms—to have some pilot projects.

I would be interested in exploring that concept with the commission as you consider flexibility, and let's try a few things. I really believe we need to be innovative and aggressive in that and make sure that good, hard science is on our side.

My question that I would like to ask—Mr. Lash, did you have a comment?

Mr. LASH. I was just going to follow up on what you said, because I think that it's a very useful idea. I think it's likely that we will find more and more often that cooperation tends to cross traditional jurisdictional lines; that is, when you begin to see cooperative recommendations, they will not fall strictly within the Clean Air Act or RCRA, and that the more we can begin to develop large-scale policy recommendations, the more there will be agreement to supersede the traditional organization of our regulatory statutes.

But it's very hard for me to imagine command and control regulatory statutes that cross those jurisdictional lines. That would be a huge change, and very complex.

Senator KEMPTHORNE. A question for Mr. Ruckelshaus. Very shortly this committee or its subcommittee will be discussing enforcement procedures under the Clean Water Act, and for the past decade we have seen that citizen suits have, in many cases, become the tools of choice in order to bring about the enforcement of environmental laws.

What I would like to ask you is, would you comment on your views of the effectiveness of citizen suits as an enforcement tool?

Mr. RUCKELSHAUS. I think in some areas citizen suits are quite effective. The Clean Water Act is an example. One of my concerns about the way we have, by statute, structured the Environmental Protection Agency is that we've given the agency an enormous amount of responsibility and not enough resources or flexibility to achieve it. And that dooms them to failure before they start.

Now, one of the things in the Clean Water Act, as an example, where the citizen has the ability to come in and enforce an environmental requirement or a Clean Water Act requirement, is where the agency doesn't have enough resources, this is a way of supplementing their resources, assuming that the suits are appropriately brought and that the administrative requirements are followed under the law.

At the same time, the vast majority of Water Act suits are now brought by the States. The same thing is true of Clean Air Act enforcement. There are a lot more enforcement people at the State level in both air and water than there are at the Federal level. In the case of air, it's something like 20 to 1. It's not quite that high in water, but it's close.

So the States should also be involved in the decisions about citizen suits, and how that is all coordinated so that the citizen doesn't usurp the responsibility of the Federal Government and the State government is an important thing for this committee and the Congress to take a look at.

Senator KEMPTHORNE. I appreciate that.

Mr. BUZZELLI. Senator, can I go back to your demonstration project concept? I wanted to be sure you understood that the President's Council is planning that as policy recommendations are made by the Council, before they are officially made to the administration, our intention is to put demonstration projects in place to demonstrate those recommendations, and to try some new concepts. And the more cross-cutting projects we can develop, the better off we're going to be; in other words, projects that require EPA, Energy, etc. to work with each other.

So I think we're right on the same track that you are.

Senator KEMPTHORNE. Good. That's great.

A final question, Mr. Chairman, then I'll depart.

Mr. Lash, Mr. Buzzelli listed six objectives. The first one was to free technology from regulations. You are serving as cochair with Mr. Buzzelli. Do you believe that the environmental interests that are represented on that commission will be willing participants and that they too would embrace that idea of coming up with means to free technology from regulations?

Mr. LASH. Yes. In fact, Mr. Buzzelli and I are already involved in several discussions among various interests outside of the President's council of precisely those interests. The first time I appeared before this committee this year was to talk about environmental technology, with a set of recommendations about steps that can be taken in order to encourage the development of new technologies.

There are, of course, issues of detail. I don't think that the environmental community would be prepared to simply say, "If it's new technology, it's not subject to regulation," but they are very interested in encouraging this because they see it as the only route to building on the progress we've already made.

Senator KEMPTHORNE. OK. Thank you.

Mr. Chairman, I think you've had a great hearing this morning. I appreciate participating.

Senator BAUCUS. Thank you for your participation and your presence.

Mr. TRAIN. Mr. Chairman, could I make one comment on something you said earlier?

Senator BAUCUS. Sure.

Mr. TRAIN. In the field of education, I share your sense of basic importance for that area. This committee, I think, was responsible for the passage of the Environmental Education Act of 1990, which mandates certain programs in EPA. I have not heard of any particular emphasis or priority being given by EPA to that program,

and I just would suggest that perhaps it might be something this committee could take a look at.

Senator BAUCUS. That's a good idea. We'll follow up on that.

I would like to pursue, a little bit, the role of international trade, in the context of sustainable development.

It seems to me that as the world is getting smaller and we are more connected—and by definition, if we're talking about sustainable development, we must face the question of how international trade fits in here. The obvious question is, what's the best way?

As we know, some environmental statutes do have trade components. For example, the Montreal Protocol provides that if a country does not abide by the terms of the Montreal Protocol, a country—say the United States, for example—could place a fee or an embargo, on products made with CFCs in those other countries.

I suspect that would not be sustained under GATT, just as the Marine Mammal Protection Act was not sustained under GATT, but nevertheless those provisions are in the Montreal Protocol.

Now we're attempting to negotiate a North American Free Trade Agreement with Mexico with strong environmental side agreements. My personal view is that we do need strong environmental side agreements containing sanctions. They can't easily be written in a way that does not "intrude upon sovereignty," a buzz word that's thrown around.

Then we have Judge Ritchie's decision as he interprets the National Environmental Policy Act and the requirement of an EIS in the context of NAFTA. I have often spoken in conversation with the prior Director General of the GATT who says that the next round of the GATT—after this present Uruguay Round, if it is ever concluded—is going to be a Green Round; that is, it must necessarily include ways of addressing international environmental considerations in the context of the GATT.

Again, if we're talking about sustainable development, it seems to me that by definition that trade laws are a part of it. I'd like to ask you how we begin to get a handle on this. What should the right approach, the right paradigm, the right model be here?

Mr. Train?

Mr. TRAIN. I think, first of all, it is important to recognize that trade agreements do have significant environmental implications. There's no question about it. I don't think we recognized that until fairly recently. I think the NAFTA negotiation is the first negotiation in history—certainly involving this country, and I'm sure anybody else—that undertook any kind of environmental consideration at all.

The Bush Administration instituted a substantial environmental review early on in the process. It took some nine months, with hearings all across the country. Over 200 witnesses testified and over 400 others submitted statements, and finally an environmental review which was several hundred pages long was made public. I don't know how perfect that was, but I think a lot of credit is due to the fact that this is the first effort ever made of that kind.

I have read Judge Ritchie's opinion and decision. I don't find it terribly persuasive myself, but then I'm not an expert on the separation of powers or some of the other Constitutional issues raised. I

think it is probably not appropriate to comment on the legal aspects.

I think it is important for this committee to consider what the proper role is in future trade negotiations and trade agreements as they relate to the environment, how that should be handled. My own sense is that the NEPA EIS process is not really a practical approach to analyzing environmental impacts of a trade agreement, nor is it a sufficient approach to dealing with the environmental implications of a trade agreement. Also, looking back to the very early days of NEPA—I guess I was about as much involved with its formulation as anyone—I don't think anyone ever dreamed of having a trade negotiation subject to an EIS process, but things do evolve. I would not say it's an impossibility; I just don't think it's a very practical answer to the problem, coming into a trade agreement after it has been negotiated and saying that an EIS must now be done when the negotiation is conducted by sovereign governments—not just ourselves, but other governments. I think it's totally impractical.

Moreover, I think the complexity of a trade agreement such as NAFTA, covering an almost endless number of commodities and services, with possible impacts of a very wide range, would be extremely difficult to analyze in the normal EIS process. I think that if Judge Ritchie's order were to be carried out, it would take many months, and then be subject to court challenge, obviously. I think about the only purpose to be served would perhaps be the derailing of the whole NAFTA process.

It seems to me that what you need here is a mandated environmental assessment process that begins at the earliest stages of negotiation, and then an ongoing process, such as contemplated in the environmental side agreement, with a North American Commission on the Environment.

One of the aspects of the EIS process is that it's sort of a "one-stop" affair. What is needed here is an ongoing process, not a one-stop examination, an ongoing process of monitoring the impacts of the trade agreement, opportunity for public comment and involvement, and a process for making adjustments in the agreement based upon the analysis of the environmental impacts as time goes on.

These are the things which I think we all hope will be forthcoming in the environmental side agreement, which hopefully will be strong. But that kind of an approach is what makes sense environmentally, and not an EIS approach, because the latter could really be quite destructive.

One suggestion I've heard as sort of a middle ground would be for the U.S. Trade Representative to undertake—recognizing that there is no mandate—the Representative would agree to undertake a programmatic kind of EIS covering trade negotiation generally rather than a specific focus on NAFTA or any other one single agreement. I think that kind of programmatic analysis could then be used by the Congress and others for a closer examination of the environmental impacts of specific trade negotiations.

Those are some comments on that.

Senator BAUCUS. I appreciate it. I'll come back to it later.

Senator Durenberger?

Senator DURENBERGER. Yes, if I might, I want to follow up on Bill Ruckelshaus' very constructive critique. He came down fairly heavily on Congress and the courts and so forth.

I prepared a series of questions that sort of go one problem at a time to ask you. I'm not going to try to ask you all of those, but just to illustrate that there is another side to it, the final solution to the so-called "acid rain problem" came from George Bush; it didn't come from the courts. We debated it forever and we all got together and passed it. The solution was a command and control solution. We now have a command and control system for every powerplant in America. But that was George's idea; that did not start here.

So I just wanted to raise the issue——

Senator BAUCUS. We introduced legislation here first.

Senator DURENBERGER. Yes, but it was the President's——

Senator BAUCUS. He finally agreed. The prior President wouldn't agree.

Senator DURENBERGER. Well, then, it's a joint responsibility.

Senator BAUCUS. Yes, it is joint.

Senator DURENBERGER. But the point that I want to try to get at here is that I'm not sure the problem is so much the command and control structure all the time as it is our relationships, the President and the Congress. And Max probably just reminded me that this was an example of a fairly successful relationship.

This past week we had the example of nonpoint source pollution, and I happen to think that nonpoint source pollution and water quality is the biggest unresolved water quality problem that we have. I think it is closely tied with sustainable development through soil erosion and issues like that. But if you follow the reports that rank environmental risk, it seems to me this is always near the top.

Here we have made various attempts at dealing with the problem. The last one was in 1987, when we created section 319 of the Clean Water Act. We put a lot of discretion in the program. We gave States the authority to develop voluntary programs, following EPA's lead. There hasn't been a single citizen suit that I'm aware of.

So you have a big problem, you have a lot of agency discretion, you don't have any court interference, and you have no progress.

The reality from my experience—and I don't want to take the time to give it to you—is that we've been fighting a series of EPA Administrators to get money into the program. Am I off base?

Mr. RUCKELSHAUS. Well, you've asked a number of questions.

I'm not blaming this problem of EPA having sufficient flexibility to accomplish its responsibilities, given to it by the Congress, on the command and control system. I don't think it's a command and control problem. I think that command and control is something that works in some cases and we ought to leave it in place where it is in those cases because it will continue to work. We need to move beyond that if we're going to address some of these newer kinds of problems, and I think nonpoint source is one of them. I think it's a terribly complex problem.

I'm not saying that simply granting more flexibility is necessarily going to solve all these problems, but I do think that one useful

way of reading a lot of our environmental statutes is as an expression of the lack of trust of the Executive Branch by the Legislative Branch. I know that was true because I was here when a lot of those statutes were passed in the first instance. And there was a lack of trust, and I'm not saying that was all misplaced, that there wasn't occasionally some reason for that mistrust to be there. But I believe in terms of human relationships, if you signal to somebody, "I don't trust you," in about a week you're going to be right because they will respond accordingly in human terms. They will respond like they're not supposed to be trusted.

What I think we need to do in terms of EPA is that this Congress, and this committee in particular, needs to be vigorous in its oversight of the responsibilities given to EPA to make sure that you understand why they're not being carried out, if in fact they are not. Are they indeed pursuing the objectives that you think are important? And then give them enough rope to hang themselves. But now what we have are standards, sometimes set by the Congress, with rigid deadlines in which to achieve them. I myself have testified many times that if the Congress does that, there is no way under the sun that I'm going to be able to meet those deadlines; and sure enough, we can't. Then we run into further rancorous hearings, more stringent deadlines set, and it's kind of a terrible spiral.

Senator DURENBERGER. Well, let me take it down another notch or up another notch, whatever it is, and just stay with nonpoint.

I don't think we had a lot of disagreement about the seriousness of the problem. I don't think that one was a relationship problem, but it got to be a money problem. And it was a problem with a small amount of money. In 1988, 1989, 1990, 1991, and 1992, we were fighting the Administrator of the EPA over putting—I think we got either $20 million or $40 million into 1988, and Lee Thomas went and killed it in the conference committee. So we got zero to implement clean water.

We're just trying to find out where we can agree on what the priorities are.

Mr. RUCKELSHAUS. But that's not just Lee Thomas; that's the administration. That's OMB. You can't have that money. I'm sure he'd have been more than happy to take the money and try to allocate it accordingly, but the administration said, "We have other priorities."

I don't know how to get around those arguments. You're going to argue over how to allocate money, and all that EPA Administrators are is instruments of OMB, of power, when they come up here and say whether you think you need money or not.

Mr. TRAIN. I would never have admitted that.

[Laughter.]

Mr. RUCKELSHAUS. I wouldn't, either.

[Laughter.]

Mr. RUCKELSHAUS. This is proof that I'm not going back the third time.

Senator DURENBERGER. I can go through this and keep beating on this, but I just want to get some little part of the onus off of us, and I guess maybe you've established that. It's a relationship problem that goes all around.

Mr. RUCKELSHAUS. Jonathan Lash and I are involved in this. We talked a little bit about the Superfund issue. There's no question that EPA can, under its existing powers, do a much better job of relating to these communities, do a much better job of answering some of the anguish that we hear coming from people affected by these sites. They don't need any more power to do that; they just need to pay more attention to the human aspects and human relationships involved.

There's plenty of blame to be passed around. I'm not suggesting it's all EPA's fault or that we're Simon pure——

Senator DURENBERGER. Well, I think the chairman has been looking for solutions, and it is very frustrating. I think I got them last year for the first time on the Oak Grove Landfill, forced them to get together with the Department of Justice and actually agree to settle out a bunch of little municipalities. One of them had brush one year and another one had storm damage another year, because of the PRP or whatever you call it, that process. They're driving people crazy.

But you're right, EPA could do something about it. I would love to sit here and go through the LUST program. The only way we got EPA to pay any attention to underground storage tanks was by calling it LUST, Leaking Underground Storage Tanks, and that made newspaper headlines. We got legislation passed; we got a gas tax, and we actually got people doing something about the issue.

I don't raise this to pick on the other side. Max and I jointly—and he has been here longer than I have—have sat here and sat through this very frustrating series of experiences on how to set priorities and how to implement those priorities. The thing I think is bothering a lot of us, and I raised it in a previous question, is the externalities problem, the private dollars problem, the reality that people out there in the business world want to know which way we're headed and what the price is going to be and so forth. On leaking underground storage tanks—I guess you talked about this already—you put on a gasoline tax or an oil tax, and then you can see that actually going into the cleanup process. That makes some sense.

There are a lot of these kinds of externalities, some of which we designed, some of which get built into the Superfund process and so forth, that are financing the transaction costs that are reducing the externalities of the problem.

But I think it is that frustrates some of us more than anything else. How can you put those private dollars to work better by giving some longer-term sense of direction to the policy? That sort of gets to be my bottom line as I listen to all of you talk about sustainable development. We have a tremendous potential in our economy and the growth of the economies of the third world if you can just put those private investment dollars to work on some long-range direction.

If I have any other questions, Mr. Chairman, that would be helpful, I will submit them for the record.

Thank you very much.

Senator BAUCUS. Thank you very much, Senator.

Mr. BUZZELLI. Senator, can I make a comment?

Senator BAUCUS. Yes, very briefly.

Mr. BUZZELLI. You said something that I feel strongly about, and that is if we can together sit down and set some goals that are off in the future, and then bring the affected parties in and say, "How are we going to reach them," that's why the 33/50 program has been successful to date, because Bill Reilly sat down with industry and said, "I can't get there fast enough with the Clean Air Act. We need to have a 50 percent reduction in 17 compounds. What can you do on your own?" That was a unique approach that had never been taken before, and I think that setting the target and then asking people what they can do to get there, how they would devise a system, is an important component of all of this.

Senator BAUCUS. It seems to me that an awful lot of this about sustainable development is helping to change incentives to public and private decision making so they are less short-term and more long-term. There's a lot of talk about that; not a lot of action, at least in the public sector.

We don't have a lot of time here, but I would like the brief thoughts of any of you on what this committee can do, what this Congress can do, and what the private sector can do to encourage decision makers to think in longer-term time horizons, because it seems to me that will necessarily force more cooperation; it will force more sustainable development. How do we encourage more of that?

Let's start with you, Mr. Lash.

Mr. LASH. Dave and I have taken the opportunity of preparing for the first commission meeting to speak to as many of the Cabinet members who are serving on the council as possible before the meeting. I have met with enormous enthusiasm and a real hope that this can become a vehicle for developing broad, long-term policies because of the recognition that so many of the decisions that are forced on policymakers are responding to short-term crises. Here's an opportunity to cooperate among jurisdictions, to involve all of the different interests, and so forth.

I think one of the most important things for the committee to do is to signal that if those kinds of recommendations are developed, if EPA comes back to you with a set of proposals in order to pursue the opportunities for multimedia projects, that the commission is not only prepared to respond, but eager to have those proposals and to give the opportunity to try those proposals.

Senator BAUCUS. I encourage the commission to be very bold, very big. Just try to throw off all the conventional ways of looking at things. Then you can always work back a little bit to be little more practical.

Mr. LASH. When else will we get the chance to think like that?

Senator BAUCUS. Exactly.

Mr. Ruckelshaus?

Mr. RUCKELSHAUS. Let me give you one example of where this committee has affected investment for the long term, both on the public and private side. Under RCRA subtitle D there are requirements for regulations to affect existing landfills, whether they are run by municipalities or the private sector, and those regulations assure that there are liners, that there is ability to collect the leachate and treat it, that you treat the methane gas, that you

monitor the groundwater, and this is done for the life of the facility and then for 30 years after it is closed.

In the short term it has caused the cost of operating and maintaining those facilities to go up, and indeed, caused that cost to go up in the long term. But in the long term the environment is going to be a lot better off. The investment is going to be more secure, and it is a direct result of Government "interference," in one sense, in the economic system to ensure that the externalities that Senator Durenberger was talking about, namely air, water, groundwater, are protected and protected in a way that makes those kinds of facilities sustainable over the long haul. In my judgment this is a very good example of how this committee and the Congress have acted wisely toward sustainable development.

Senator BAUCUS. Mr. Train, what longer-term incentives?

Mr. TRAIN. I think the most basic thing I can think of at the moment is shifting our sights from the short-term to the long-term on the part of policymakers in Government. An effective way to begin to bring this about would be the development of a national environmental strategy. That, by its very nature, would be long-term. I think that prour would force, both in terms of process and in terms of agency thinking of their own programs, a whole new framework based upon sustainable development which again, as you pointed out, is by its nature long-term. So that would be my suggestion.

Senator BAUCUS. Thank you.

Mr. Buzzelli?

Mr. BUZZELLI. I agree with the strategy development. You have already sent a powerful signal. I think this committee continuing to ask people to come before it and to think about what we can do differently than we're doing today—that's not usually something that happens in a congressional committee because that forces long-term thinking. And quite frankly, it's a hard question. What would you do differently? Most people don't think about that very often; they usually think about what's wrong with today. I think the process that you are conducting today, and which I hope you will continue to conduct, will force people to come forward with some better ideas.

Senator BAUCUS. Well, thank you.

Thank you all very much. You have been very helpful, and this will not be the last hearing on this subject.

The hearing is adjourned.

[Whereupon, at 12:22 p.m., the committee adjourned, to reconvene at the call of the Chair.]

[Statements submitted for the record follow:]

STATEMENT OF RUSSELL E. TRAIN, CHAIRMAN, WORLD WILDLIFE FUND, AND CHAIRMAN, NATIONAL COMMISSION ON THE ENVIRONMENT

Mr. Chairman and members of the Committee, I welcome your invitation to testify on the broad issue of how we can improve environmental protection for the future, with particular reference to the need for sustainable development.

On a personal note, I cannot help but recall that it was 20 years ago that I appeared before this Committee to testify in connection with my confirmation as the second Administrator of the Environmental Protection Agency (EPA). I was Chairman of the Council on Environmental Quality (CEQ) at the time. And, Mr. Chairman, I have to add that during my tenure at EPA, it would have been impossible to

have had a more supportive relationship than I had with this Committee on a bipartisan basis. I shall always be grateful for that support.

I applaud your recognition of the need to take stock of the environmental challenges facing the United States. It is very timely. It was this same recognition that led the World Wildlife Fund (WWF) to establish the National Commission on the Environment which I have had the privilege of chairing. WWF convened this bipartisan commission in 1991 to review U.S. environmental policy and develop strategies to address the enormous environmental challenges of the future. Our report, Choosing a Sustainable Future, was released last December. I commend the report to you as a valuable guide to future environmental policy and ask that its summary statement be included with my testimony in the record of this hearing. Indeed, I must credit the commission with many of the ideas I will share with you today.

In addition to my distinguished colleague here today, Bill Ruckelshaus, and myself, the 19 commission members included two additional former EPA Administrators, another former CEQ Chair, a former governor, and several former state environmental agency heads, as well as leaders from business, science, the environmental community, and academia. Sitting members of Congress and active members of the Executive Branch were not on the commission, although representatives from both participated as official observers. The commissioners brought together expertise in the vast array of areas that both affect and are affected by the environment: biology, anthropology, religion/ethics, government, business, law, environmental activism, health, engineering, and economics, among others. Several of the commission members were prominent in the Clinton transition; several have entered the new Administration.

While the commission made a large number of specific recommendations, its overarching achievement lay not so much in the formulation of specific proposals—indeed, few of these were original with the commission—but rather in the integration of environmental issues and recommendations into a conceptual whole, all focused on the goal of a sustainable future. We concluded that the environment must become as fundamental a consideration as economics in planning, policy-making, and human activities.

It has been gratifying to see the extent to which a number of the commission's recommendations already either have been adopted or are in the process of adoption. Legislation creating a Department of the Environment has passed the Senate and the House is considering the issue. A broad-based energy tax is part of the Administration's economic package and has passed the House. While this chamber passed a somewhat less ambitious gasoline tax—I would urge you to consider a significantly higher gasoline tax that might actually affect gasoline consumption—some form of tax on energy consumption will be included in the final legislation. The Secretary of the Interior has instituted a national survey of biological diversity. The Administration has announced reversal of the so-called "Mexico City Policy," relating to U.S. funding for international family planning organizations. President Clinton has also committed the United States to the terms of the biodiversity treaty and to strong implementation of the climate convention. The commission recommends all of these steps.

Of course, not all of our advice has been heeded. Thus, while the commission recommends "a strengthened and revitalized" CEQ, the Administration has proposed abolishing CEQ and substituting it with the non-statutory White House Office of Environmental Policy (OEP). (Mr. Chairman, as I have already expressed my views on that subject to you by letter in connection with your Committee's April 1 hearing on the matter, I will not repeat them here.) Likewise, action on our recommendations for the phasing out of certain subsidies for users of the public lands, which was originally included in the Administration's economic package, has been dropped or at least deferred.

Issue—Driven Priorities

Environmental policy has evolved over the years largely as a response to various environmental crises, real or perceived. Each crisis has given rise to its own remedial program, usually of a regulatory nature. We have divided the environment into media, such as air, water, solid and hazardous waste, endangered species, and natural resources. Each area has its own list of priority problems, statutory response, set of regulatory requirements, and each has its own separate governmental office, and is subject to the jurisdiction of numerous congressional Committees and subcommittees. Finally, each problem's priorities compete for attention and resources.

This fragmented, remedial, and crisis-driven approach has, in fact, achieved some important environmental improvements over the past two decades. The air quality in many of our cities is cleaner primarily due to the regulation of automobile emis-

sions. We also have reduced many pollutant discharges from municipal and industrial sources. America has, in truth, made tremendous strides in protecting the environment. This Committee has played a major role in these achievements.

Nevertheless, our commission concluded that the current piecemeal, reactive approach simply will not be able to deal with the burgeoning environmental problems of the future—problems that inevitably will arise from the enormous growth both in economic activity and human numbers expected during the next century. In the next 50 years—within the lifetimes of many of us and most of our children—economic activity in the United States is projected to quadruple. Already, Americans, who constitute 5 percent of the world's population, consume in excess of 25 percent of the world's energy resources and generate considerably more than our proportionate share of waste.

During the same 50 year period, global population levels are projected to at least double; more than 95 percent of that growth occurring in the poorer nations of the South. Meeting the high consumption demands of industrialized nations and the basic needs—let alone development aspirations—of the developing world will seriously jeopardize the natural resource base, natural systems, and the quality of life of all the Earth's inhabitants.

We are now in a position to choose between two radically different futures. We can continue as we have, and fall farther and farther behind the problems. Or, as the commission puts it, if "our country pioneers new teclmologies, shifts its policies, makes bold economic changes, and embraces a new ethic of environmentally responsible behavior, it is far more likely that the coming years will bring a higher quality of life, a healthier environment, and a more vibrant economy for all Americans." The choice is clear and became the title of our report—*Choosing a Sustainable Future.*

Choosing A Sustainable Future

The first order of business is to develop a positive vision of the future. This vision-our goal—must transcend the false dichotomies that have historically impeded the effectiveness of environmental policy. These false conflicts include economic growth versus environment, man versus nature, owls versus people, technology versus behavior, and the United States versus the world.

Our vision is of a future that embraces sustainable development. While this term may seem over used or ill-defined, it captures the essence of the interdependence of environmental quality and economic growth. Sustainable development is a strategy for improving quality of life while preserving environmental integrity; it means living off nature's interest, not running through its capital. Sustainable development means leaving future generations at least as many options as we have enjoyed.

There have been, and undoubtedly will continue to be efforts to define sustainable development quantitatively. Such efforts provide important guidance in shaping policies and behavior and for measuring progress. In my view, however, our vision would be ill-served by forcing a precise definition. According to our report:

> Sustainable development is a strategy for improving the quality of life while preserving the environmental potential for the future, of living off interest rather than consuming natural capital. Sustainable development mandates that the present generation must not narrow the choices of future generations but must strive to expand them by passing on an environment and an accumulation of resources that will allow its children to live at least as well as, and preferably better than, people today.

Sustainable development is a concept that reflects the basic human ideal of a better quality of life for all. Like "democracy" or "liberty," "sustainable development," should be open to various interpretations so that it will remain a fundamental tenet to guide humanity for generations to come.

At the same time, I recognize that vague generalizations are not of much help either to this Committee or other policy-makers. As for myself, I feel a bit like the late Supreme Court Justice Potter Stewart who said in his opinion dealing with pornography, "I may not be able to define it but I know it when I see it." I generally feel that I know unsustainable behavior when I see it.

I believe that the question of what is or is not sustainable development is usually best addressed in the context of a particular issue or activity, rather than as a generalization. These contexts also can provide important criteria or indicators which can both shape policies and priorities and be monitored to assess progress toward them. Thus, for example in the energy sector, reliance on fossil fuels as our principal source of energy is demonstrably not sustainable over the indefinite future. Land use activities that progressively destroy or cut up habitat and erode biological

diversity are not sustainable. Agricultural practices that reduce the natural fertility and productivity of the soil are not sustainable. Fishing practices that deplete fish stocks below replacement levels are not sustainable. The production and use of chioroflourocarbons that destroy the stratospheric ozone layer are not sustainable. Unlimited human population growth is not sustainable. Present processes and practices involving the generation and disposal of wastes—particularly toxic wastes—are not sustainable.

As you know, World Wildlife Fund (WWF) is an international conservation organization that prides itself on its field programs as well as its policy development and analysis capabilities. WWF has undertaken more than 2,000 projects in 116 countries, many of which are "integrated conservation and development projects" and as such provide examples of sustainable development in practice. Examples include:

Integrated Conservation and Development in the Central African Republic (CAR): The forest in this area is one of only a few remaining undisturbed lowland tropical forests in central Africa. Its ecosystems support 13 species of diurnal primates (including chimps and gorillas), forest elephants, bongo, rich flora, and indigenous hunter-gather people. The "forest is under increasing pressure from uncontrolled logging and mining, human and agricultural encroachment, and poaching. To address these threats, the CAR government and WWF have created the Dzanga-Ndoki National Park and Dzanga-Sangha Dense Forest Special Reserve. The park is intended to serve as a model project in the participatory approach to integrated conservation and development. The "special reserve" classification allows for multiple use of the protected area, including traditional hunting, rural development, selective hunting, and tourism, as well as areas of total protection. A local non-governmental organization, supported by tourism revenues, has been created to serve in park/reserve management. Elements of the conservation and development program for these areas include: tourist development, complete coverage for the areas by anti-poaching teams, small enterprise development, improved health care, and environmental education.

Partnership with the Hoopa Valley Indian Tribe of Northern California: The 89,000 square acre Hoopa reservation contains significant biological resources, including 30,000 square acres of old growth timber and more than 40 nesting pairs of northern spotted owls. The economy of the tribal government currently is virtually dependent on revenues from the sale of timber. The Tribe and WWF have joined together to develop a sustainable resource development plan that will help the Tribe diversify its economic base by exploring other natural resources besides timber, including: edible mushrooms, a restored anadromous fishery, native plans with pharmaceutical potential; on-site milling and other changes in timber management; sand and gravel mining; economic options related to their recreational, scenic, and historic resources.

The lessons learned through these experiences thus become the elements that must be considered when formulating an effective strategy to achieve the goal of sustainability. Our ability to address them will differ in degree, time frame, and capacity.

The goal of sustainable development, therefore, provides the context in which U.S. environmental policy can anticipate and avert problems and integrate priorities. The key methodological change is to move from remediation to prevention. This entails shifting the consideration of environmental issues to the beginning of the decision-making processes-whether in the development of international trade policies, design of an automobile, or purchase of a light bulb. The necessary shift will depend on a set of complementary incentives, of all sorts: regulatory, economic, social, ethical, and effective leadership (the incentives of example and clear commitment) among them. Perhaps the most critical forces for change are information and participation. People must be equipped with complete information about the environmental as well as the economic impacts of a decision, so that they can make and implement informed choices.

Certainly there are many obstacles to achieving these changes. In many cases we do not have adequate information upon which to build priorities and actions. Policy makers and scientists often relate ineffectively. Entrenchment in the status quo is another major obstacle that affects the development of technology, economic shifts (the energy tax I mentioned earlier is an obvious example), and governance generally. The high level of distrust in government seriously inhibits our ability to implement change. I have already alluded to structural problems in government—the media-specific orientation of the EPA, the numerous committee jurisdictions over environmental issues, the absence of an effective integrating force—that need to be reformed.

Our commission identifies many solutions to these and other roadblocks, and I would refer you to the full report for more detail. Below, I will discuss steps to surpass these obstacles in the context of specific recommendations for action.

Tools to Move from Vision to Reality

1. *The National Environmental Strategy*

It stands to reason that careful and comprehensive planning can anticipate and resolve most problems long before they become crises. In the private sector, business executives know this, and perform near, medium and long term as well as integrated planning to ensure the profitability of their business enterprises. In the public sector, however, most planning is in the context of the ordinary budget cycle and, thus, is relatively short-term. A comprehensive, long term National Environmental Strategy is an essential tool for moving from remediation to prevention, for charting a long-range course toward a sustainable future.

Preparing and implementing a National Environmental Strategy will not be an easy task. The Dutch government fell over the issue of financing its National Environmental Policy Plan in 1989, but the Netherlands Plan has now been adopted. The plan is designed to achieve sustainable development within 25 years.

While circumstances in the Netherlands are considerably different than those in the United States, the Plan's framework, development, and implementation provide useful guidance. It was prepared by four government ministries, sets goals for reducing pollution in various economic sectors, and outlines the actions and Financing needed to achieve the goals. The plan is based on trend forecasts and is regularly updated as it is viewed as an evolving instrument of national policy. Implementation is achieved through consultation among government entities and "target groups" who develop plans to reduce pollutant discharges into the environment, the generation of waste, and the consumption of energy.

Our own National Commission on the Environment recommended that a National Environmental Strategy for the United States be developed and implemented by a new Department of the Environment. We envisioned the Department as having a significantly broader mandate and more diverse capabilities than the present EPA. Because the Strategy would affect the policies and programs of virtually all government departments and agencies, it should be coordinated throughout the federal government.

As I have mentioned, our commission also recommended that a "strengthened and revitalized" Council on Environmental Quality play an important role in coordinating and integrating the strategy within government. It is my view that CEQ provides the President with one of the few mechanisms he has for truly integrated policy development throughout the Executive Branch. Without CEQ, the new Office of Environmental Policy in the White House could undertake to perform this role.

The recently created President's Council on Sustainable Development also could play a role in defining the elements of the strategy; certainly the council presents an opportunity to advance toward the goal of sustainable development. The very able co-chairmen, who sit here with me today, could do much to achieve this by identifying the essential components of sustainable development and recommending policies and practices to promote it.

A National Environmental Strategy should, at least, incorporate these characteristics:

- Have as its principal thrust the achievement of sustainable development;
- Be developed with the coordination of departments in the Executive Branch, with the involvement of Congress, state government, the private sector, and the public;
- Be based on first-rate science, particularly with respect to assessing environmental conditions (not only air, water, and land, but also biological diversity) and the effects of pollution, and to making projections of future environmental conditions;
- Describe a long term, perhaps fifty-year, vision;
- Set out medium and near term measurable environmental quality targets—for example, reducing chemicals released by the agricultural sector by a certain percent;
- Use integrated approaches. Strategies that can promote this include:
  -permitting across environmental media;
  -ecosystem or habitat-wide protection; and
  -life-cycle assessment of environmental impacts;
- Promote the use of incentives, both economic and regulatory, but carefully directed at the key actor, for example by establishing "take back" programs

where manufacturers are responsible for disposal of certain products, and by imposing taxes or charges and/or rebate schemes;
- Identify key indicators of sustainable development—those specifically relating to the environment might include the quality of soils, forests, water, fisheries, biodiversity, and ultimately, ecosystems. Indicators of social and economic development—poverty, education, health, among them—should also be included.
- Require effective monitoring of trends and evaluation of programs; and
- Be subject to periodic review (2-5 years) and adjustment as necessary to incorporate changes in scientific, technological, and environmental knowledge.

The commission anticipated that the Strategy would be created by legislation. An amendment requiring development of a National Environmental Strategy was offered to S. 171, and subsequently was withdrawn. I understand that the President is considering issuing an Executive Order that would require the OEP to develop a strategy. I would endorse an order establishing a National Environmental Strategy with the characteristics I have outlined and encourage its swift preparation in order to commence our transition toward sustainable development. At the same time, I must state my strong preference for a statutory mandate; an effective strategy must have the active and positive participation of the Congress. Moreover, periodic review and oversight are functions that the Congress uniquely can provide. It is hard for me to imagine an Environmental Impact Statement (EIS) process established solely by Executive action and without the mandate provided by the National Environmental Policy Act. Accordingly, I urge this Committee to undertake the legislative task of requiring the development and implementation of the National Environmental Strategy.

The effectiveness of the National Environmental Strategy in achieving and maintaining long term environmental quality will depend on complementary changes in four related areas: pricing, technology development, environmental literacy, and governmental leadership.

1. *Pricing:* There is no more powerful tool for change than pricing. Simply put, in market economies, prices determine what people buy and use and what people produce and sell.

However, the market currently treats the environment and natural resources in ways that send conflicting and sometimes inappropriate signals. For example, natural resources and environmental impacts are not valued in the market. The classic example of this failure to "internalize the externalities" is the case of gasoline. In real dollars, the price of gasoline is lower now than it was twenty years ago. Even with an additional tax of $1 per gallon, the price would only be about the same as premium was in 1981. As a result, more people drive more. The adverse impacts of this growing appetite for and dependence on gasoline are all too many and are becoming quite familiar: climate warming, urban air pollution, oil spills, congestion, urban sprawl, dependence on foreign sources of oil which, in turn, contributes to our large trade imbalances and adversely affects our national security to name some of the most important impacts. Unless the costs of these impacts are reflected in the price of gasoline, the problems will grow. In the past 20 years, vehicle miles travelled (VMT) have increased by 90 percent!

Another important area for pricing changes are those relating to natural resources on public lands. Certain government policies permit the taking or use of natural resources from public lands at below market cost. This devaluation encourages exploitation of the nation's natural capital at unsustainable rates. The President has committed himself to addressing this problem and Secretary Babbitt is taking some important administrative steps. Congress must act as well.

The system of national accounts does no better. In the system of national accounts, natural resource depletion is counted, if at all, as an increase in national wealth in the form of products and jobs. There is no corresponding decrease in capital as the resource is consumed. Indeed, the national accounting system perversely views pollution as an economic benefit, because clean ups create jobs and economic activity, both of which are taken as additions to wealth. I understand that in his Earth Day speech, President Clinton pledged to explore these deficiencies in our national accounting system in a "Green GDP Initiative."

The market must be corrected to send clear signals that will encourage changes in processes, products, and behavior. Correct pricing can help achieve both long term environmental and economic health. The commission recommended specific price changes to achieve environmental goals, including:

- An increase in the federal tax on gasoline of about $1.00/gallon, to be phased-in over five years;
- A tax on carbon in fuels, starting at $6/ton and increasing over five years to $30/ton;

- Reducing or eliminating certain subsidies and below-market arrangements that encourage the exploitation of natural resources; and
- Changing the measure of national income to include environmental and natural resource values.

2. Using and Developing Green Technologies: Technology has been the source of humanity's ability to protect itself from and exploit nature. Technological innovation also has improved standards of living around the world. This, however, also has often been at a significant environmental cost. It is essential that we harness technology to serve the goal of sustainable development. This is particularly true in the energy sector where the environmental costs are especially high and where alternative, less polluting technologies are often readily available.

The United States government must get behind its industry and promote the development of green technologies. This will benefit the environment as well as the U.S. economy and national security. I know that several bills, including one introduced by the Chairman of this Committee, are being considered that would promote environmental and green technologies and hope such legislation will emphasize

- Using tax and procurement policies as incentives;
- Encouraging collaborative government/private sector undertakings (such as the Advanced Battery Consortium);
- Promote the development and use technologies that prevent pollution in the first instance;
- Considering the impacts of trade regimes; and
- Increasing targeted R&D funding (while the United States spends more to support technology development than its main competitors, Japan and Germany, we do little to ensure that the investment yields tangible benefits).

3. *Promoting Environmental Literacy:* Peoples' choices respecting technology, resource consumption, land use, fertility, and lifestyle are the ultimate determinants of environmental quality. It is essential, therefore, to foster the development of an "environmentally literate" society that respects environmental values and assumes responsibility for putting these values into practice. Empowered with a strong environmental ethic, people will be motivated to make the extra efforts necessary to protect and improve the environment; efforts that are, and, in a free society, should remain, beyond the reach of economic or legal incentives.

In the words of our commission report:

> All of us must develop a greater sense of ethical responsibility for the environment. Environmental ethics are founded on an awareness that humanity is part of nature and that nature's myriad parts are interdependent. In any natural community, the well-being of the individual and of each species is tied to the well-being of the whole. In a world increasingly without environmental borders, each individual and every nation has a fundamental ethical responsibility to respect nature and to care for the Earth, protecting its life-support systems, biodiversiry, and beauty. In this extraordinarily interdependent world, each person should feel an ethical responsibility not only to a local or national community but to the larger global community and to future generations.

Specific way to promote the development of environmental literacy include:

- Strengthen the environmental curricula at all levels in the educational system. At the college and graduate school levels, particularly, interdisciplinary programs should be designed to provide students with the opportunity to explore the interrelationships among environmental sciences and other disciplines.
- Promote more open and participatory decision-making processes: regulatory negotiations, involvement of Non-Governmental Organizations (NGOs) and others at the U.N. Conference on Environment and Development (UNCED) and other international forum, consortia to develop new technologies, state and local sustainable development initiatives are all encouraging examples of the effectiveness of a more participatory process; and
- Give information to the public: the effectiveness of the Public Right to Know provision of the Superfund amendments has been tremendous and the Toxics Release Inventory (TRI) should be expanded to cover more kinds of chemicals and facilities. Other steps include meaningful environmental labelling programs, environmental audits with at least some of the information made public, shareholder groups that focus on environmental performance, and awards for environmental performance.
- Exercise strong leadership by publicly embracing an environmental ethic. The President, Congress, leaders in the private sector, teachers, journalists, parents, religious leaders must continue to demonstrate the importance of environmen-

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tal matters in their own actions. Purchasing decisions, policy planning, speeches and articles, and public priorities must reflect this commitment.

4. *Governmental Leadership:* The United States must exercise strong and committed leadership in addressing environmental problems, both at home and internationally. Taking swift and certain action to follow through on the U.S. environmental commitments will be the true leadership test and I note that the recent joint effort among EPA, the Department of Agriculture and the Food and Drug Administration to reduce the application of chemicals in agriculture as a positive example of such leadership. This kind of leadership can rebuild public confidence in government.

Steps to establish governmental leadership and commitment to the environment include:

- Creating a cabinet level Department of the Environment;
- Active participation and leadership in international environmental matters. The U.S. broad experience and technical capacity for addressing environmental needs is unparalleled. I have already mentioned some important commitments that the President has made. These include signing the biodiversity convention, and assuming a leadership role in United Nations fora, such as on population and sustainable development. Effective follow-up will be critical.
- Demonstrating federal leadership by, for example, waiving sovereign immunity from enforcement of federal environmental laws and adopting procurement policies to promote the use of green technologies; and
- Giving priority to environmental equity (consideration should be given to including distributional impacts in the environmental impact assessment process).

Conclusion

Mr. Chairman, I believe that the single most important step which this Committee and the Congress can take in furtherance of the goal of sustainable development is to produce legislation mandating a National Environment Strategy. I have already outlined some core elements of such a Strategy should be and have explained why I believe strongly that such a Strategy should be the subject of specific legislation rather than simply an Executive Order.

A key to moving U.S. policy in the direction of sustainable development is recognition of the fact that sustainability is not simply the business of an environmental department or agency. It must be the business of all government. Environmental considerations and, more specifically criteria for achieving sustainability, must be integrated into the ongoing operations of agencies dealing with energy, transportation, agriculture, public lands management, trade, marine resources, etc. The Strategy should represent a cooperative undertaking between the Congress and the Executive Branch. Thus, authorizing legislation directing a new Department of the Environment to take the lead in developing a National Environmental Strategy could be written in fairly broad terms. An Executive Order by the President then could detail the cooperation to be provided by other agencies and also spell out the coordinating role of the White House Office of Environmental Policy. From long personal experience, I know how difficult it often is to induce established bureaucracies to commit themselves to new approaches. A strong Congressional mandate is essential to the job.

Rather then the piecemeal policies of the past, the time has come for a whole new approach to the environment; one that emphasizes a long-term strategic focus on a sustainable future. I urge this Committee to take the lead in building such an approach. It is crucial to our future.

Thank you.

CHOOSING A SUSTAINABLE FUTURE

The Report of the National Commission on the Environment

Preface, Summary, and Recommendations (see back cover for full report information)

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PREFACE

This report of the National Commission on the Environment is particularly timely as a new administration prepares to take office. There has been much solid progress in addressing environmental problems in the United States. If we are to address adequately the challenges of the future, however, it is time for basic change in environmental policy.

The National Commission on the Environment is a private-sector initiative convened by World Wildlife Fund (WWF), which provided funds and logistical support but has not sought in any way to influence this report.

The Commission's 19 members met 8 times—once in San Francisco, once in Racine, Wisconsin, and six times in Washington, D.C. The members are culturally, geographically, and occupationally diverse. They have expertise in government, science, economics, engineering, education, public policy, international finance, business, and religion; they come from both grassroots and national environmental organizations, and from federal and state environmental agencies. No person presently employed by government is included.

Despite the broad base of the Commission's membership, it has proved impossible to appoint individuals from all desirable areas without making the Commission unwieldy. We have tried to remedy these omissions by actively soliciting suggestions and comments from many groups and by briefing them on the progress of the Commission's work.

A remarkably high degree of agreement characterized the Commission's discussions, and all of the Commissioners subscribe to the basic themes of this report. In view of the large number of recommendations and the diverse composition of the Commission, it would have been remarkable if all the Commissioners had supported each of the recommendations, and in fact this was not the case. However, we are united behind the goal of sustainable development and fully support the basic approaches that the report recommends for achieving that goal.

The Commission recognizes that environmental issues are so broad in scope and touch on so many facets of American life that it would be impractical to try to deal with all of them in a single report, given the time constraints and resources available. The Commission has therefore been selective, focusing on those issues and concepts that appeared to us to have the highest priority. Moreover, because of the composition of this Commission, we focused more on the U.S. Environmental Protection Agency than on other environmental agencies.

We also limited our inquiry and recommendations to U.S. policy rather than proposing environmental policies for the world. Global policies and processes are urgently needed; nevertheless, our report focuses on U.S. policies that (necessarily in our view) affect both the domestic issues and international activities of our nation. Finally, we should note that the Commission has not undertaken original analysis but rather has drawn on the accumulated experience and wisdom of its members and of others.

Any introductory note of this kind would be incomplete without acknowledging the Commission's debt to J. Clarence (Terry) Davies, our executive director, and Amelia Salzman, our project director, without whose perseverance and energy this report might not have been written.

—Russell E. Train
Chairman,
National Commission on the Environment

CRISIS AND OPPORTUNITY

We, the members of the National Commission on the Environment, are convinced that the natural processes that support life on Earth are increasingly at risk and that by choosing to act or not to act to confront this risk now, our country is choosing between two very different futures. If America continues down its current path, primarily reacting to environmental injuries and trying to repair them, the quality of our environment will continue to deteriorate, and eventually our economy will decline as well. If, however, our country pioneers new technologies, shifts its policies, makes bold economic changes, and embraces a new ethic of environmentally responsible behavior, it is far more likely that the coming years will bring a higher quality of life, a healthier environment, and a more vibrant economy for all Americans.

U.S. leadership should be based on the concept of *sustainable development.* By the close of the twentieth century, economic development and environmental protection must come together in a new synthesis: broad-based economic progress accomplished in a manner that protects and restores the quality of the natural environment, improves the quality of life for individuals, and broadens the prospects for future generations. This merging of economic and environmental goals in the concept of sustainable development can and should constitute a central guiding principle for national environmental and economic policymaking.

Sustainable development is predicated on the recognition that economic and environmental goals are inextricably linked. Long-term growth depends on a sound environment, and resources to protect the environment will come from economic strength. Both goals—that is, environmental and economic health—are intended to improve the quality of life of individuals, communities, and society. To the extent that either environmental or economic policy impoverishes the quality of life, it has failed.

The choice between crisis and sustainable development is one that our nation shares with the rest of the world. It must be addressed through international cooperation and by U.S. commitment to action at home and leadership abroad. As the world's single largest economy, the largest user of natural resources, the largest producer and consumer of energy, and the largest producer of carbon dioxide pollution, the United States has a special responsibility to exercise world leadership. Indeed, a commitment to such leadership is essential. The complexity and scope of current environmental challenges demand the ingenuity, expertise, and technology for which the United States is famous.

Over the past 20 years, an impressive array of federal, state, and local pollution control and resource management programs, both public and private, have been instituted in the United States. Total U.S. expenditures on environmental protection now average more than 2 percent of the gross national product annually. The United States has had the foresight to adopt stringent environmental laws and regulations and to make sizable economic investments in pollution control and energy efficiency. As a result, our nation has not had to contend with landscapes as blighted, air and water as polluted, soils as poisoned, or public health as ravaged as in Central and Eastern Europe. The measurable environmental progress made by the United States should be a source of national pride.

Still, our country's environmental achievements should not lull Americans into complacency. Despite numerous victories, the United States is losing many battles:

- *Global environmental problems* to which the United States makes no small contribution—loss of biodiversity, climate change, and stratospheric ozone depletion, for instance—are placing both human and natural systems at grave risk.

- The *air* in U.S. cities threatens to deteriorate further as improvements in auto emission controls are overwhelmed by the sheer numbers of cars and miles driven and by congestion. Meanwhile, indoor air pollution is largely ignored.
- Disposal and cleanup of the vast amounts of *waste* generated each year pose great difficulties and consume an increasing proportion of the limited funds available for environmental protection. Indirect sources of pollution, such as urban and agricultural runoff, continue almost unabated.
- Encroaching *land development* is displacing and undermining critical ecosystems such as wetlands and threatens rural landscapes, natural areas, and biological diversity.
- Large areas of national forest and other *public lands and resources* are not managed sustainably.
- *Farmlands* are suffering from soil loss and excessive use of chemicals.
- *Freshwater aquifers* are being consumed and contaminated at an alarming rate in many areas.
- *Overfishing and pollution* are seriously depleting our most important commercial fisheries.
- In many U.S. *inner cities*, the physical environment has the look of a wasteland.

This litany of environmental ills, familiar-sounding and by no means complete, is a product of today's level and character of economic activity and human population. We must also consider tomorrow. Over the next 50 years—within the lifetimes of many of us and of all our children—economic activity in the United States is projected to quadruple and global population to double at least. If growth of this magnitude occurs with current industrial processes, agricultural methods, and consumer practices, the results could be both environmentally and economically disastrous.

Forecasts based on linear projections are often wrong. In the case of environmental conditions, such projections may be too optimistic.

Ample evidence suggests that unless our nation acts decisively now, the price will be serious—in some instances irreversible—environmental harm. Undoubtedly, technology and manufacturing processes will evolve over the next 50 years, in some cases outstripping our imagination. However, in view of the fact that the versatile but polluting combustion engine is still with us, despite waves of technological innovation over the past century and our growing knowledge of how to bring alternatives on line, it would be the height of folly for our nation to sit back and simply hope that the future will be "greened" by an invisible hand. The United States must take deliberate steps to shape the future now.

Short-term needs are always more readily placed ahead of long-term goals and personal desires ahead of societal ones. Excuses for inaction—budget deficits, opposition to taxes, foreign competition—abound. Yet the continuing pursuit of "politics as usual" will almost certainly guarantee failure.

As history teaches, the only defense against political inertia is leadership, and in this regard environmental issues are no exception. The American public must insist that its leaders understand the stark realities of the environmental challenge. Leaders in business, government, labor, education, and the environmental community have to muster the political will to bring the nation together to face its problems head-on. Now more than ever, the American public has to become an informed, concerned, and committed public that will demand such leadership.

The United Nations Conference on Environment and Development, which met in Rio de Janeiro in June 1992, was an important beginning for the process of providing a new environmental agenda based on the concept of sustainable development. The need now is to translate that broad agenda into specific national action plans. Among other things, this report and the recommendations within it contain the ingredients of such a plan for the United States.

The course we chart will not be easy. Periodic adjustments will undoubtedly have to be made to minimize short-term economic and other difficulties. But there must be an end to U.S. ambivalence about the environment and a beginning of a steadfast commitment to improving the environment both nationally and internationally. *The United States must have a long-term strategy for pursuing the goal of sustainable development.* Such a balanced strategy should be able to antici-

pate and avoid severe local and regional economic dislocations and stimulate adjustment assistance and job retraining.

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As we stated at the outset, economic and environmental well-being are mutually reinforcing goals that must be pursued simultaneously if either is to be achieved. Economic growth cannot be sustained if it continues to undermine the healthy functioning of the Earth's natural systems or to exhaust natural resources. By the same token, only healthy economies can generate the resources necessary for investments in environmental protection.

Poverty is the enemy of the environment. Environmental protection is not possible where poverty is pervasive and the quality of life degraded. For this reason, one of the principal objectives of environmental policy must be to ensure a decent standard of living for all.

Innovations made to achieve sustainable development will themselves bring major economic benefits. The economic advantage of using materials and energy efficiently is obvious, and the domestic production and use of environmentally sound technologies will reap profits both for the U.S. firms that sell them and for those who use them.

The most efficient way to achieve environmental progress, therefore, is to harness market forces. Here, the role of public policy is to send the right signals to the economy—"getting the prices right" and making the marketplace work for instead of against environmental protection. Taxes and subsidies can be used to ensure that prices reflect environmental costs.

We harbor no illusions that market economics alone will put the United States or the world on the path to sustainable development. Government regulations and private and individual initiatives are also required. Regrettably, the U.S. statutory and regulatory system is woefully inadequate, cumbersome, and sometimes even perverse with respect to environmental issues. A regime that now emphasizes "end-of-the-pipe" cleanup must be radically reformed into one that makes use of economic incentives and encourages pollution prevention. Changing product design or manufacturing processes to minimize or prevent pollution is obviously superior to mandating expensive cleanups after the fact. And an environmentally literate public can encourage such efforts by demanding environmentally acceptable products.

If environmental prevention is to prevail over environmental cure and if the United States is to remain an international industrial leader, our country must rapidly develop and deploy a wide array of new, more efficient, and environmentally safe technologies. This need for new technology is particularly acute in the realms of transportation and energy generation because these activities currently account for so much environmental degradation.

Simply put, there must be a deep-seated change in how our country produces and uses energy. No single area of activity is so closely interwoven with the environment. Were it not for the world's large reliance on fossil fuels for both energy production and transportation, the problems of global warming, acid rain, and urban smog would be relatively minor. A progressive shift away from fossil fuels as quickly as possible in both the energy and transportation sectors is crucial. Because the United States uses in excess of one-fourth of the world's energy, largely generated by fossil fuels, it must be a leader in developing other energy sources.

Economic incentives dramatically different from those now in force are required. Coal, oil, and gas prices, for instance, must reflect the environmental costs associated with their combustion. Over the long term, the United States must shift to alternative nonpolluting sources of energy, principally from renewable sources. In the interim, the country must develop technologies that use energy more efficiently and thereby consume less fuel. A federal carbon tax should be phased in to move the economy in this direction and away from reliance on fossil fuels.

In transportation, the long-range need is a shift in auto technology to alternative sources of energy that will pollute our cities less. This will require incentives for more fuel-efficient autos and for fewer miles driven, as well as for new technologies such as electricity and, in the longer term, hydrogen. To curb current pollution levels, the federal gasoline tax should be raised gradually and predictably over several years—for example, by about $0.20 each year for five years. We believe that only an increase of this magnitude will work to change driving patterns and technological development. Even with this tax, the cost of gasoline in the United States would remain about the same price (in constant dollars) as the cost of premium gas here in 1981. Because of the potentially regressive impact of gasoline taxes, a system of tax credits or rebates could be used to offset hardships.

In agriculture, in manufacturing processes, in consumer products, and in almost every other sector of the economy, new technologies will give the United States a competitive edge as well as a healthier environment. The worldwide market for such technologies will continue to grow as the connections between environmental and economic well-being become more apparent. The economic potential of trade in such technologies is no secret; Japan and Germany, among others, have already moved aggressively into this field. If America moves ahead in this technology race, it will be because our country has at last understood that we need a technological revolution, not just another technical fix.

Along with dramatic economic opportunities, a commitment to sustainable development could bring timely new political opportunities, particularly in foreign affairs. With the end of the Cold War and the Communist threat, the bond that held the United States and its allies together for half a century has loosened. The international community is breaking into national or (at best) regional groupings pursuing their own narrow self-interests. Prospects for sustainable development could shatter in such a divided world. We are convinced that the urgent need to put the world on the road to sustainability provides a common purpose that can and must unite the global community.

While the principal thrust of this report is to recommend measures for putting America's environmental house in order, the United States has a huge stake in effectively addressing global environmental problems. As Barbara Ward and Rene Dubos said, all of us have two countries—"our own and Planet Earth." The threat of global climate change, for example, requires national initiatives in the United States, but the problem really can be addressed only through a common worldwide effort. The destruction of forests will exacerbate global warming and accelerate the loss of species and ecosystems, foreclosing medical, recreational, and trade opportunities for the United States as well as diminishing the world's shared biological heritage. The great potential for expanding trade with developing countries will not be realized unless these nations achieve sustainable development. U.S. national security interests depend increasingly on achieving a level of international stability that can come only from sustainable development.

The most critical need facing the world is the control of human numbers. Continued global population growth of the current magni-

tude—one billion more people every decade—will swamp economic and social progress as well as efforts to protect the environment. Our nation and all others will gain from efforts to stabilize world population and to improve living standards in developing countries, where 90 percent of the projected population growth will occur. The burden placed on the environment is a product of population and consumption. The priorities for the developed countries are to switch to sustainable technologies and to reduce wasteful consumption; the priorities for the developing countries are to develop sustainably and curb population growth.

The United States must make a major commitment to cooperate with the world community to stabilize global population, recognizing the linkages between birth rates, child survival, economic development, education, and the economic and social status of women. Universal access to effective family-planning information, contraceptives, and health care is essential. We recommend a reversal of the U.S. policy that prohibits funding to certain family-planning organizations, and we urge greatly increasing U.S. funding of international population programs and of economic assistance to developing countries.

A key failure in the U.S. effort to address environmental needs has been the widespread failure to recognize the need for effective land-use planning. We do not suggest that the federal government should preempt the traditional roles of state and local governments in this area. The federal government must lead the way by managing its own lands consistent with the principle of sustainable development. State and local governments as well as other regional groups should undertake land-use planning for a variety of reasons: to protect environmentally sensitive areas, including watersheds, aquifers, and wetlands; to maintain biological diversity; to sustain the productivity of agricultural land; to ensure that sites for economic activity are appropriate and available; to encourage energy efficiency; and to protect sites of natural beauty and of historic and cultural value. To help make land use consistent with the overarching goal of sustainable development, we recommend the enactment of federal legislation that encourages state and regional authorities to develop land-use planning procedures based on such criteria.

Sustainable development depends on integrating environmental values into policy and decisionmaking across an entire spectrum of governmental functions. To facilitate integration as well as the major

changes in current environmental policies that we envision, a cabinet-level Department of the Environment is needed—not just an elevated Environmental Protection Agency, but a department with additional functions and roles. This department cannot be exclusively or primarily regulatory but must also be able to formulate and oversee the implementation of a National Environmental Strategy. It can spearhead a radical revision of our country's pollution control laws to encourage innovation, pollution prevention, and more coherent, cross-media approaches. The President and Congress should be united on such a goal and on the overall national and global strategy.

As human population inevitably will continue to increase for the next half-century or more, and as sustainable development will not be an easy accomplishment, citizens must learn to devote themselves to the achievement of long-term goals, not just short-term satisfactions. The nation must stop stealing the environmental capital of future generations and must live instead on its fair share of nature's interest.

An informed citizenry with an ethical commitment to care for the environment is essential to the future we envision. Success with the technological, economic, and governmental changes that we recommend is predicated on the understanding and wholehearted support of the American people. Environmental values must be integrated into the lifestyles of individuals and families as well as into the conduct of businesses, labor, and governments.

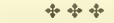
To this end, the nation as a whole and especially its schools must pledge themselves to the goal of environmental literacy. U.S. citizens must have the knowledge, practical competence, and moral understanding to cooperate in building a sustainable civilization. The pursuit of environmental literacy will require curricular innovations from kindergarten through college, changes in teacher education programs, expanded graduate programs, and continuing education, both formal and informal. Enhanced science research will improve our knowledge of ecosystems, habitats, and public health and will add to environmental literacy.

All of us must develop a greater sense of ethical responsibility for the environment. Environmental ethics are founded on an awareness that humanity is part of nature and that nature's myriad parts are interdependent. In any natural community, the well-being of the individual and of each species is tied to the well-being of the whole. In a world

increasingly without environmental borders, each individual and every nation has a fundamental ethical responsibility to respect nature and to care for the Earth, protecting its life-support systems, biodiversity, and beauty. In this extraordinarily interdependent world, each person should feel an ethical responsibility not only to a local or national community but to the larger global community and to future generations.

It is only within such a framework that the values to sustain and guide us will be found as we move toward the goal of sustainable development. Schools, religious institutions, and the news media as well as businesses, governments, and (perhaps above all) families must share in the tasks of achieving this aim.

We have a vision for the future: a vision of an America and a world in which humanity lives and prospers in harmonious, sustainable balance with the natural systems of the Earth. America has an opportunity to rise to the challenge of environmental leadership as it has to the causes of human liberty, equality, and free and open markets. The challenge starts at home.



This introductory statement summarizes the main focuses of the Commission's thinking as well as its principal recommendations. Detailed discussion and additional recommendations are found in the full report.

KEY RECOMMENDATIONS

Chapter 1. The Goal of Sustainable Development: Sustainable development should be the primary goal of environmental and economic policy.

Chapter 2. Technologies for Sustainable Development: The most important and immediate target of U.S. environmental policy is to encourage the development and adoption of technologies compatible with sustainable development.

Design for the environment must take its place alongside cost, safety, and health as a guiding criterion for technology development. It is imperative that the government provide incentives for the development and adoption of environmentally benign technologies.

New federal tax and other policies, such as enactment of a carefully crafted investment tax credit or "green" research and development tax incentives, are needed to stimulate savings and investment in environmentally advantageous technologies.

In the discharge of their responsibilities, especially in procurement decisions, government agencies must make deliberate efforts to encourage new technologies.

The United States should promote a business climate to help U.S. environmental technology companies compete in the growing world market and should stimulate the global market for new

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technologies. It should also launch a coordinated international research effort to develop environmentally sound technologies.

The federal government should substantially increase funding for research and development, and participate in partnerships with private industry to explore new and innovative technologies that are environmentally sound.

Regulations affecting technology should be based on extensive and unbiased assessments of the technological possibilities and associated costs as well as their effectiveness in promoting technology development and use. Regulatory obstacles to the development and introduction of environmentally superior technology should be removed.

Chapter 3. Economics for Sustainable Development: Getting the prices right involves eliminating price-distorting subsidies, taxing environmentally harmful activities, and revising the way economic activity is measured.

The federal tax on gasoline should be increased gradually and predictably over several years—for example, by $0.20/gallon annually for five years.

The United States should enact a carbon tax phased in over several years—for example, starting at $6/ton of carbon and increasing over five years to $30/ton.

Water subsidies to growers should be reduced or eliminated.

Resource and environmental factors should be incorporated into macroeconomic measures.

Chapter 4. Environmental Literacy: Schools, families, religious institutions, the media, businesses, and government must cooperate in fostering the development of an environmentally literate citizenry that respects environmental values and assumes responsibility for putting the values into practice.

State and local governments should continue to develop and institute interdisciplinary environmental curricula. The federal government

should provide resources, including financial support, for the development and implementation of state and local environmental-education initiatives.

Corporate leaders should make long-term environmental management a basic component of their strategic decisionmaking and planning.

Businesses should undertake regular environmental audits and make periodic reports to the public on their environmental performance.

Consumer-labeling efforts should continue to involve government, private industry, consumer groups, and environmental organizations in developing labels that are clear and easily understood by the consumer.

Chapter 5. Governance for Sustainable Development: Environmental considerations must become integral to all governmental policies.

Congress and the President should work together to develop a National Environmental Strategy. This strategy should be the basis for federal agencies to incorporate environmental considerations into their plans and policies. It should also be the basis for the federal government's work with the private sector to achieve sustainable development.

Congress must reform its committee structure to avoid overlap and confusion over environmental issues.

Congress and the President should create a Department of the Environment. A principal function of the new department would be the formulation and oversight of the National Environmental Strategy.

The Council on Environmental Quality (CEQ) should be strengthened and revitalized.

Regaining trust should be a goal of every government agency and employee and of every political reformer and policymaker.

Congress should pass legislation clearly waiving federal immunity from the application and enforcement of federal environmental laws.

The U.S. Environmental Protection Agency (EPA) should give higher priority to environmental equity and revise its data collection, assessment, and citizen participation efforts accordingly.

Chapter 6. America's New Global Role: The United States has a vital interest in leading efforts to protect the global environment, moderate world population growth, and improve the standard of living in developing nations.

The United States should make protecting the global environment a high-priority concern of both domestic and foreign policy.

Concluding effective international environmental agreements should become a higher priority of the United States. Specifically, the United States should sign the biodiversity treaty and aggressively implement and strengthen the climate convention, reevaluating the convention's terms as the science evolves.

The United States should actively promote the effective implementation of Agenda 21 and support both a strong Commission on Sustainable Development to follow up on the Earth Summit and a new U.N. environmental agency, built out of the United Nations Environment Programme (UNEP), to promote international environmental cooperation and agreement.

The U.S. development assistance program and other U.S. policies affecting developing countries should be reoriented and enhanced to achieve sustainable development and to protect the global environment.

The United States should sharply increase its overall financial support for development assistance to developing countries.

The U.S. Foreign Assistance Act should be rewritten to address the environmental and development challenges of the post-Cold War era, and the U.S. Agency for International Development should be strengthened and revitalized to give development assistance a fresh start.

An international system of regional centers, including existing national and regional centers and institutions, should be established to develop, disseminate, and encourage the use of environmentally sustainable technologies.

The United States should urge the former Eastern bloc nations to incorporate environmental considerations into their economic reforms and should provide technical assistance to implement such measures.

To meet its proportionate share of the U.N. goal, the United States should increase its population assistance to at least $650 million in 1993 and to at least $1.2 billion in 2000.

The United States should demonstrate its leadership in meeting the demand for population-related services by increasing its assistance to developing countries for population programs and services and by reversing its "Mexico City Policy."

The United States should provide leadership in promoting the rights and status of women worldwide.

The United States should support free trade, with safeguards to ensure that all countries move toward high environmental standards.

The United States, in consultation with interested parties, should formulate and urge adoption of GATT provisions that prevent trade rules from undermining environmental measures and that also prevent spurious environmental measures from being used as trade barriers.

Chapter 7. Energy and the Environment: The most critical technologies for sustainable development are energy technologies. Highest priority should go to energy efficiency.

The states and the federal government should develop and maintain programs that provide incentives for energy efficiency, such as allowing utilities to earn as much by improving efficiency as by increasing production.

The Department of Energy's R&D budget should be reoriented to emphasize renewable and nonfossil fuel sources of energy.

Implementing the gasoline and carbon taxes recommended in Chapter 3 would contribute significantly to putting America on an energy path consistent with sustainable development.

Chapter 8. Preventing Pollution: Efforts to halt pollution should become more integrated and holistic; pollution prevention should take priority over pollution control.

The Toxics Release Inventory (TRI) provisions should be expanded to cover more types of industries and more facilities, including federal facilities. The TRI should be combined with facility planning to reduce toxics.

Congress should enact legislation requiring the new Department of the Environment to begin issuing integrated permits covering air, water, and solid waste by 1997. Working with Congress, the Department should develop legislation for integrating all pollution control functions as soon as is practicable.

The government should give high priority to efforts to narrow the gap between public perceptions of risk and expert evaluations of risk. These efforts should include promoting citizen participation.

EPA or the Department of the Environment should establish an office for long-range forecasting, and CEQ, working closely with state and federal environmental agencies, should issue periodic reports articulating 5- and 10-year environmental quality goals with specific and measurable national, state, and international objectives.

A Center for Environmental Statistics should be established in the Department of the Environment. The center, working closely with CEQ and other agencies, should produce regular reports on environmental conditions and trends.

Chapter 9. Habitats for Humans and Other Species: Environmentally sensitive management of public and private land is essential to achieving environmental goals and economic growth over the long term.

Congress should enact legislation to:

— support state and local land-use planning by identifying and establishing planning criteria to provide for balanced use of lands, to protect environmental quality, and to provide for economic and other social purposes; and

— ensure that any federal actions are consistent with and meet state or local plans that accord with the federal criteria, and provide financial support for development and implementation of the state plans.

Management on public lands that is now based on multiple use should be made compatible with sustainability.

The President should issue an executive order establishing an interagency policy committee on federal lands to identify and to establish priorities and coordinate the management of environmentally significant federal lands.

Subsidies and below-market arrangements that encourage unsustainable use of natural resources on public lands should be eliminated.

Protection and enhancement of the native biodiversity and important ecosystems of the United States should be a national goal, and the federal government should institute a national policy strategy aimed at conserving biodiversity.

Congress should enact legislation requiring a National Inventory of Biodiversity for public and private lands and establishing a mechanism for disseminating this information to planners and resource managers.

Congress should increase appropriations for the Endangered Species Act with particular support for Habitat Conservation Plans.

The Magnuson Act should be significantly amended to provide better long-term protection for commercial fish species.

Russell Train
World Wildlife Fund
August 19, 1993

Answers to Questions from Senator Baucus

1. Targeted priority-setting is key to getting the United States ahead of the environmental challenges of the future. The National Commission on the Environment made several recommendations designed to improve priority-setting, including: expanding the provisions of the Toxics Release Inventory, or Community-Right-to-Know law, to cover more industries and facilities, to narrow the gap between public and expert perceptions of risk, to improve the scientific capacity of government to monitor and forecast environmental trends, to develop a national survey of biological diversity, and to give higher priority to environmental equity in data collections, assessment, and environmental programs.

I have not had the opportunity to review your Environmental Justice Act, S. 1161, at length. Nonetheless, I strongly concur with its goals of providing information that can be used to assess health effects by income and race, identifying priority toxic release areas and activities that have significant adverse health effects, assessing those health effects resulting from such emissions, ensuring participation by the affected public, and broadly, incorporating environmental equity into the federal environmental programs and laws.

Setting priorities based on the identification of high toxic impact areas is an effective way to focus environmental programs. I believe that the proposed system of priorities would be strengthened if adverse effects to wildlife or ecosystems, as well as humans, were included, and if pollution prevention were stated as the preferred means of addressing the threats.

2. The fact that economically depressed areas also tend to suffer greater environmental degradation is strong evidence that environmental quality is dependent on economic strength. This is a very serious problem that we must aggressively address, although in my experience, it is not the result of any discriminatory objective on the part of government.

The Environmental Justice Act (EJA) and community-right-to-know laws are very helpful tools to address the environmental plight of the poor and minorities. Armed with the source and chemical specific information generated by the community-right-to-know laws, and the specific toxics impact information from the EJA, citizens will be in a much stronger position to effectively participate in environmental decision-making. However, even if the public had complete information about discharges and unencumbered participation in government decision making on environmental issues, the long-term problems that link environmental and economic distress likely would persist. Enduring solutions to these problems will require the implementation of fully integrated and equitable policies to shift toward sustainable development. We must develop a broader strategy to address these issues--as well as the other social disgraces humanity suffers at the hands of necessity, including hunger, inequality, lack of education, homelessness, crime, and disease, so that all people can share in a higher quality of life.

Russell Train
World Wildlife Fund
August 19, 1993

Answers to Questions from Senator Boxer

1. I strongly support the strategy of promoting more public/private cooperative initiatives to protect the environment. Meeting the environmental challenges of the future will require actions and commitments that are beyond the ability or appropriate scope of regulatory schemes. Cooperative undertakings that place a premium on early involvement of the interested parties, and particularly those that focus on pollution prevention and integration of environmental concerns into planning and actions of the private sector, can lead to efficient and creative solutions to environmental problems. Such efforts also promote the development of an environmental ethic--a personally-held belief in the value of a high quality environment--that can motivate businesses, governments, as well as individuals, to take the extra steps that are beyond the reach of legal imperatives. I strongly believe that it will take these types of initiatives to help us prepare for the environmental challenges of the future.

I am hard pressed to come up with an example that demonstrates all the best elements of such a cooperative arrangement. There has been progress in many areas. For example, regulatory negotiations or "reg negs" can help to streamline the regulatory development process, target regulations, and avoid protracted legal challenges. Cooperative programs to develop green technology, such as the U.S. Advanced Battery Consortium, evince the ability of government/private sector to develop cooperation and hopefully market more environmentally sound electric vehicles in the near future. EPA's Green Lights program has heightened awareness in many companies of the cost-effectiveness and ease of reducing energy consumption, thus ultimately reducing greenhouse gas emissions. Finally, I would mention EPA's voluntary 33/50 program for the accelerated reduction of emissions of 17 high-priority toxic chemicals. The success of this program--that called upon the cooperation of EPA, private industry and the states--is demonstrated by the fact that its interim target of 33 percent reduction was achieved a year early.

2. I am not a member of the President's Council on Sustainable Development (PCSD), and am not aware of their specific plans. Having recently served as the Chairman of the private sector National Commission on the Environment, which spent almost two years reviewing U.S. environmental policy and developing a set of specific recommendations to help shift the United States onto to the path of sustainable development, I hope that the PCSD will be able to pick up from our lead and refine our thinking into practical steps toward sustainable development. These recommendations naturally should be made to the President, to Congress, and to the public as well.

I hope that the PCSD will devise a plan that will integrate environmental concerns fundamentally into all policies and activities. My suggestion would be for the Council to do several specific things, including:

-- establishing environmental quality targets based on specific indicators of sustainable development;

-- prepare a specific strategy to attain the targets, perhaps starting with one set of activities that generates particularly severe environmental impacts and that would demonstrate the need for an integrated and preventive approach. I would suggest that the energy or agricultural sector would be good choices; and

-- holding public hearings and fora both to allow for public review of the Council's work and to inform the public of the Council's progress.

3. Again, as someone who is not a member of the President's Council on Sustainable Development, I am not in a position to respond definitively. It is fair to assume, however, that the Council's interaction with federal agencies will be quite direct in light of the fact that the EPA Administrator and the Secretaries of Interior, Agriculture, Commerce, and Energy are members.

4. I certainly agree with you that sustainable development is difficult to define, and I am inclined to conclude that imposing a quantitative definition on the concept would do a disservice to its utility as a social objective. I believe, that my testimony responds quite directly to your questions, as in it I discuss the meaning of sustainable development and examples both of unsustainable practices and of projects that promote sustainable development:

> While this term [sustainable development] may seem over used or ill-defined, it captures the essence of the interdependence of environmental quality and economic growth. Sustainable development is a strategy for improving quality of life while preserving environmental integrity; it means living off nature's interest, not running through its capital. Sustainable development means leaving future generations at least as many options as we have enjoyed. * * *
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> I believe that the question of what is or is not sustainable development is usually best addressed in the context of a particular issue or activity, rather than as a generalization. These contexts can provide important criteria which can both shape policy priorities and be monitored to assess progress toward them. Thus for example, in the energy sector, reliance on fossil fuels as our principal source of energy is demonstrably not sustainable over the indefinite future. Land use activities that destroy or disturb habitat and erode biological diversity are not sustainable. Agricultural practices that reduce the natural fertility and productivity of the soil are not sustainable. Fishing practices that deplete fish stocks below replacement levels are not sustainable. The production and use of chloroflourocarbons that destroy the stratospheric ozone layer are not sustainable. Unlimited human population growth is not sustainable. Present processes and practices involving the generation and disposal of wastes--particularly toxic wastes--are not sustainable.
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> As you know, World Wildlife Fund (WWF) is an international conservation organization that prides itself on its field programs as well as its policy

development and analysis capabilities. WWF has undertaken more than 2,000 projects in 116 countries, many of which are "integrated conservation and development projects" and as such provide examples of sustainable development in practice. Two examples are:

Integrated Conservation and Development in the Central African Republic CAR): The forest in this area is one of only a few remaining undisturbed lowland tropical forests in central Africa. Its ecosystems support 13 species of diurnal primates (including chimps and gorillas), forest elephants, bongo, rich flora, and indigenous hunter-gather people. The forest is under increasing pressure from uncontrolled logging and mining, human and agricultural encroachment, and poaching. To address these threats, the CAR government and WWF have created the Dzanga-Ndoki National Park and Dzanga-Sangha Dense Forest Special Reserve. The park is intended to serve as a model project in the participatory approach to integrated conservation and development. The "special reserve" classification allows for multiple use of the protected area, including traditional hunting, rural development, selective hunting, and tourism, as well as areas of total protection. A local non-governmental organization, supported by tourism revenues, has been created to serve in park/reserve management. Elements of the conservation and development program for these areas include: tourist development, complete coverage for the areas by anti-poaching teams, small enterprise development, improved health care, and environmental education.

Partnership with the Hoopa Valley Indian Tribe of Northern California: The 89,000 square acre Hoopa reservation contains significant biological resources, including 30,000 square acres of old growth timber and more than 40 nesting pairs of northern spotted owls. The economy of the tribal government currently is virtually dependent on revenues from the sale of timber. The Tribe and WWF have joined together to develop a sustainable resource development plan that will help the Tribe diversify its economic base by exploring other natural resources besides timber, including: edible mushrooms, a restored anadromous fishery, native plans with pharmaceutical potential; on-site milling and other changes in timber management; sand and gravel mining; economic options related to their recreational, scenic, and historic resources.

In closing, I would like to commend the Committee for holding these "Taking Stock" hearings and providing a forum to discuss future policy directions and the necessity of sustainable resource practices. We appreciate your foresight and willingness to take on the daunting yet crucial task of reshaping our outlook for future environmental needs in a manner that will preserve the diversity of life on Earth by protecting natural areas and wildlife populations, by promoting sustainable use of natural resources, and by maximizing the reduction of pollution - while preserving equally important national/international policies and programs. WWF welcomes the opportunity to assist in this process to assure that we establish priorities for a national environmental strategy that can work effectively and in conjunction with other federal statutes and regulatory schemes toward achieving a bright sustainable future for All.

ADDITIONAL QUESTIONS FOR ALL THE WITNESSES
FROM SENATOR BAUCUS

The Environmental Justice Act that I introduced in June could have easily been called the "Setting Priorities Act." It requires the EPA to list the most toxic 100 communities, and then to act quickly in any of those communities where pollution poses a significant health risk.

In your testimony, you recommended that we set priorities when writing and rewriting environmental laws. I would appreciate your evaluation of this very focused effort to set priorities that cut across environmental media.

In addition, I would appreciate your insight in the consideration given to the possibility that poor areas might become environmental as well as economic ghettos. In drafting some of the landmark environmental laws, was this likelihood foreseen? Will laws such as the Community Right-to-Know Act and the proposed Environmental Justice Act help us avoid this outcome in the future?

SENATOR BARBARA BOXER QUESTIONS ON ENVIRONMENTAL SUSTAINABILITY

EPW Committee Hearing
on Taking Stock

July 16, 1993

Questions to Mr. Train and Mr. Ruckelshaus

1) As you know, many in our country are experimenting with ways to implement cooperative arrangements between government and the private sector to solve environmental problems. My colleague

Senator Lautenberg's voluntary cleanup bill is just one example of this innovative approach. I would like each of you to identify and briefly describe your favorite example of a cooperative environmental problem solving effort.

2) How do each of you envision the role of the President's Sustainable Development Commission in U.S. environmental policy formulation?

3) How will the President's Sustainable Development Commission interact with the many federal agencies that carry out environmental policy?

4) "Sustainable development" is a very catchy phrase. Unfortunately, it is difficult to succinctly define. Can each of you give several examples of development patters that are not sustainable. What American practices do you feel exemplify un-sustainability?

STATEMENT OF WILLIAM D. RUCKELSHAUS, CHAIRMAN AND CHIEF EXECUTIVE OFFICER, BROWNING-FERRIS INDUSTRIES, INC.

Thank you for this opportunity to testify at these "Taking Stock" hearings on the future of our nation's environmental program. You've asked me to speak about the various regulatory tools now in use and how to adapt them to suit the environmental challenges we office today and will face in the coming years, and also about the prospects for achieving sustainable development.

It seems to me the first tool we ought to study is the calendar. It's not 1970 any more, nor 1980. The regulatory tools we developed for the environmental problems of decades past are not adequate to those of the present, far less those that we can see clearly looming in the future. Worse than that, these antique control systems may actually impede the tasks before us.

Primary among those tasks is the drive to make the human economy environmentally sustainable. This is what is meant by the term "sustainable development. " A few words about the origin and usefulness of this concept may be appropriate here.

In 1983, the United Nations established an independent body called the World Commission on Environment and Development. It was composed primarily of political and governmental leaders from around the world and chaired by the Prime Minister of Norway, Gro Harlem Brundlland. Its charge was to examine the problems of pollution, population, resource depletion, energy and food supply worldwide for the next thirty years. We came to the unavoidable conclusion that the central problem facing mankind in the latter 20th century and' beyond was how to alleviate the poverty of two-thirds of humanity without at the same time severely damaging the biological resources of the planet.

The World Commission's analysis of this problem was based on three critical perceptions: first,that the industrialization of the current developed nations had engendered massive environmental damage, which was enormously expensive to fix; second, that the developing nations did not believe that they could "afford" to consider environmental problems—that is, they thought that protecting their environment and economic growth were mutually exclusive, and that the path of damaging growth pursued by the original industrial nations was the only one available; and third, that nations *remaining* in poverty also posed a threat to the environment, particularly with respect to the survival of critical marine or land based habitats and species diversity.

Sustainable development was the solution to this complex of problems offered by the World Commission. It asserted that economic growth and environmental protection are not contradictory, in the long term, and that there are policies that can be adopted by both the developed and developing nations that will bring continued growth to the former and economic development to the latter without permanent damage to the major systems—atmosphere, oceans, fresh waters ,tropical forests, and so on—that support life on Earth.

One thing has become clear since these ideas were first voiced: the less developed nations will not act simply on prescription. Example on the part of the rich nations is required. The recent world environmental congress at Rio de Janeiro has confirmed this view. The wealthy nations still produce most of the world's pollution. It is also true that only the sad experience of how much it takes in hard cash to clean-up a ruined environment—an experience that only the industrialized nations yet share—can demonstrate the simple lesson that preventive investments made in building a sustainable economy from the outset have a high payoff. The industrialized world must therefore lead the way to sustainability through action.

Here it is essential that the United States regain its former lead in environmental affairs, because in my view the United States is the only nation capable of demonstrating a sustainable economy on the appropriate scale. Our capabilities are impressive and virtually unique. We have in place the legal and administrative structures for effective environmental change; at both the Federal and the state levels, we have tens of thousands of skilled scientists, engineers, and administrators well versed in the technical aspects of environmental protection. Our citizens support environmental goals as strongly as do those of any other large nation. We have a vigorous environmental technology sector, that has become a major source of job growth. In short, we have had more experience than any other nation at turning important environmental programs, and despite the current slackness, we still have, in the world's largest economy, the money to demonstrate what sustainable development means.

We will not, however, proceed as we ought to, and will not exert the influence we ought to around the globe, unless we change the way our environmental policies and programs actually work. If we examine the "archaeology" of our current pro-

gram mix, we will see why this is so. At the lowest, most primal level, we find the basic Federal programs of the early '70s. These programs were focused on the control of gross pollutants in the air and water—the Kind you can smell, see, touch, id taste. The regulatory philosophy behind them was known as "command and control." In this philosophy, government simply decides, on the basis of scientific analysis, what levels of pollution are "safe," and commands polluters to reduce their pollution below these levels. The government also determined what technological controls are available, and further commanded that industry install these on its various facilities.

Such programs arise from specific statutes directed to the problems in individual environmental media—the air, the surface waters, and so on. This is a frustrating business, because nature herself does not so distinguish among the various sectors of the environment, and pollution flows easily between them,sometimes as a direct result of the environmental programs instituted to protect nature. As we move up through the legal strata, therefore, we find statute after statute, program after program,designed to attack problems that the previous laws missed or made worse. Thus, for example,the nation was scandalized in the late 70's when it was discovered that industry was taking much of the gunk that it had previously disposed of in the air and the water and burying it in huge, unregulated holes in the ground. The result was, of course, yet another spate of lawmaking, to control the putative hazardous waste crisis.

All this is not to say that command and control, as practiced for the last two decades has been of no avail—far from it. The environment is much cleaner than it was, and vastly cleaner than it would have been had we done nothing. We still have many environmental problems in this country, and many of them are under social control. So command and control regulation works—up to a point. Beyond that point, you can spend a lot of money and Dot get much environmental benefit.

Command and control is inherently expensive and inherently inefficient, because every firm has to move in lock-step, directed by a bureaucracy; because there's no real incentive for technological advance; and because most of what you're doing is collecting pollution at the end of a pipe, and then you have to find somewhere to put it. The present enthusiasm for using "market forces" to achieve environmental goals is a clear recognition of the need for well crafted incentives in our laws and a new willingness to examine our statutes for the unintended consequences of their present implementation

This is the point at which we now find ourselves. The Administrator of EPA must follow the rules of nine major statutes, none of which were designed specifically to work with one another. There is no integrating principal at all built into this statutory armory. Each is written to stand alone, as if the world were made entirely of air or water or some other target of our concern. No word in all this law directs EPA to simply find the combination of policies across all programs that will garner the maximum benefit to the environment for every dollar of control costs expended.

And there is worse. Running through the strata of statutes like a vein of ore, written into the language and intent of the law, is the assumption that the EPA cannot be trusted with discretion. The environmental statutes of the United States exhibit a degree of rigor and specificity all enforceable by the courts, unknown in those of other nations or, indeed, in any other branch of Federal law.

It is easy to see why this came about. The early 70's, under the shadow of the Vietnam war and Watergate, were not the best time for devising a set of laws in which confidence by the legislative branch, in the good intentions of the Executive branch, played an important role. Our laws consequently exhibit no such confidence. The expectation is built into them, in the form of rigid timetables, numerical standards, and opportunities for lawsuits, that the Environmental Protection Agency is not particularly interested in protecting the environment.

The Administrator of EPA is thus largely stripped of the opportunity to make sensible judgments about environmental damage and what should be done about it. For example, where a particular substance appears to present an environmental or health danger, EPA has, under certain of its laws, only two legal choices—ban it or do nothing. Whether it does something or nothing, EPA is almost sure to be sued. About eighty per cent of EPA's decisions are challenged in court. In fact, neither this Congress nor the Administration really defined our nation's environmental program—the courts do. Actual, rather than theoretical, pollution control is largely accomplished via consent decree, a process that is slow, grossly inefficient, and—because slow and inefficient—ultimately damaging to the very environment the whole unwieldy structure was designed to protect.

I submit that this is not a proper role for the judiciary. It is absurd that, after months of Congressional debate, after sometimes years of studies and deliberation

by EPA, the decision about what some factory in Michigan is actually going to do about its pollution rests in the hands of some district judge.

This hyper-legalism has another malign effect on the parties most involved in environmental debate. The environmental interest groups are conditioned to push for the most stringent standards and the strictest timetables, knowing full well that these will not be met. The point is rather to promote occasions for lawsuits. On the industry side the situation has led to a general policy favoring delay, and the avoidance of any real implementation of control measures until the mills of law have ground slowly to their conclusion.

Thus we find ourselves with an environmental regime that is not only unnecessarily slow and clumsy, but that exacerbates the very mistrust that created it in the first place. Consider: you pass an environmental bill with lofty goals, strict timetables, and an open invitation to sue. Years pass and the goals are not fulfilled. The program is locked up in court. Someone must be responsible for the failure. It must be the Administrator of EPA.

The ritual public torment of EPA Administrators has become a standard feature of environmental politics in this country. Certainly I was not spared this honor by the Congress, the courts or environmentalists. Meanwhile, no one is looking at that judge up in Michigan or the District of Columbia who's really running the environmental programs or our trade policy in the name of protecting the environment.

It should now be clear, after twenty years and a succession of different Administrations, such blame slinging, however politically satisfying, is of no real use. Failure to progress as we would like is not the fault of EPA, but of its tools.

A new set of tools must therefore be provided, and Congress must forge them. We need, to begin with, a National Environmental Strategy. The recent National Commission on the Environment, chaired by Russell Train, developed the broad outlines of a national environmental strategy, which I commend to the Committee's attention, and suggested the nation develop a more detailed strategy to guide its every step. Among the goals recommended by the Train Commission were:

- the encouragement and adoption of environmentally benign technologies by the government,through changes in procurement policies, tax credits, increased investment in research and development, and removal of current regulatory obstacles. The highest priority here should go to increasing energy efficiency.
- the elimination of price-distorting subsides, taxing environmentally harmful activities, and revising the way economic growth is measured, to take in the full costs of environmental degradation
- the environmental legislation must be revised. Conflicting and antiquated statutes should be replaced by a new organic act, directing the EPA to protect the environment in an integrated and cost-effective manner,with a new focus on pollution prevention. The committee structure of the Congress should be revised as well, so that the EPA reports to a single committee in each house.

This last point deserves some clarification. It is a bold recommendation, but in my view, nothing less will do the job. Discretion and administrative potency must be restored to the EPA,if we are not to suffer more years of partial paralysis and misallocation of resources. I have already referred to the paralysis; the misallocation was documented some years ago, when the EPA's own senior staff, after months of careful analysis, concluded that the bulk of the EPA's resources and attention was not directed at the nation's worst environmental problems. 'The conclusion must be that the totality of environmental law yields the perverse effect of preventing the EPA from doing its best to protect the, environment.

Most of all, honesty and trust must be restored to environmental law. Honesty means not devising environmental goals that we cannot reasonably achieve at costs that our people are unwilling to pay. We have at last to face that fact that Americans love both the environment and the most polluting lifestyle on earth. With time, a greater and greater proportion of insults to the environment will come not from industrial plant but from the way we like to live, and our laws must be reshaped to reflect that, or we will continue to spin our wheels on ice.

Without pointing too many fingers, let me say that Congress has a critical role to play here, one that may cause some changes in how it conducts its business. With a politically divided national government, it has been too easy for the last 12 years to simply blame our environmental problems on the other party. In the process, we have caused serious damage to the credibility of our institutions and avoided the tough work of serious examination of our environmental statutes.

This is not to suggest that Congress must not be responsive to the concerns of its constituents, but that concern must be balanced by some deference to the agency created to help solve our environmental problems. It is the proper role of Congress to set broad environmental goals for EPA and provide it with the necessary re-

sources to achieve those goals. The agency must be given more discretion as to how those goals are to be achieved. Regular and informed oversight, the purpose of which is to further guide EPA in the achievement of Congressionally mandated goals, is the critical role for Congress.

Trust means giving the EPA the discretion to do a sensible job, to shape policy in reasonable accord with the best scientific estimates of the severity of the environmental damage rather than in response to what's hot on the six o'clock news. In making its decisions, it should be subject to but two constraints: the powerful oversight that will be exerted by the consolidated Congressional committees, and the normal judicial sanction against arbitrary and capricious actions.

It will not be easy to establish such a regime. So weak has our environmental protection apparatus become, and so dependent on the courts for any finality to its decisions, that it has little influence over the parties in contention in environmental disputes. There is no reason for such parties to come to the table in a spirit of compromise and rationality while there is a probability that the courts will deliver the ultimate prize. Even the President can barely make an environment decision stick, as witness the tirade of objections from both sides in the recently proposed Northwest timber harvesting plan.

The transition to a more sustainable economy will not be easy; we have little practical experience to guide us right now. What we need is experience born of trying to implement the principles with which we are all familiar. Without going into too much detail right now, let me suggest that one possible means of developing that experience would be through a Congressionally mandated and supported "pilot program" in sustainable development in one state.

A state with a strong natural resource base and a small population would be a good candidate for such an experiment (say Montana). The effort would necessarily involve intensive and innovative means to communicate with and involve the state's citizens.

This should not be a casual undertaking; it will take time, patience, resources and lots of attention. But the yields for the future would be enormous.

I believe that a correct view of the necessity for these changes will help to overcome the profound political difficulty of such a course. That view assumes that environmental security will begin to move from the periphery to the center in international as well as domestic affairs, and eventually comprise, along with economic security, the centerpiece of national policy, as military security did during the era of superpower confrontation. This will happen not because the environment in the U.S. is getting worse—it is clearly improving—but because the actions of other nations will have increasingly important effects on the global environment. Our foreign policy will become increasingly environmental and economic, as it once was primarily political and military.

And just as we could not have fostered the near-miraculous rebirth of liberty we have observed throughout the world in recent years, had our prosperity and democratic institutions not served as examples, so we will not be able to foster the appropriate environmental behavior throughout the world as long as our environmental institutions are in their current condition.

RESPONSES FROM WILLIAM RUCKELSHAUS TO QUESTIONS FROM SENATOR BOXER

Question 1. As you know, many in our country are experimenting with ways to implement cooperative arrangements between government and the private sector to solve environmental problems. My colleague Senator Lautenberg's voluntary cleanup bill is just one example of this innovative approach. I would like each of you to identify and briefly describe your favorite example of a cooperative environmental problem solving effort.

Answer: In the last few years we have seen many successful efforts of problem solving through cooperation rather than confrontation. I recall a 1989 gathering at MIT of 25 representatives of industry, government, environmental groups, citizens groups and academics. The participants held the full spectrum of opinions on incineration but nonetheless were able to forego the usual posturing and agree on strategies to address uncertainty surrounding the health and environmental impacts of incineration.

Likewise, the EPA Green Lights program, a voluntary program that encourages the widespread use of energy efficient lighting, is proving that environmental organizations and industry can work together to create a cost-efficient and environmentally aware America. It is estimated that by the year 2000 full implementation of Green Lights would save 39.8 million kilowatts

of electricity, preventing $59.7 billion in needless power plants investments. My own company, Browning Ferris Industries, which cooperates in this program, expects to add $1.5 million in profit to its bottom line as a direct result of Green Lights. We plan to participate in the expansion of this initiative to heating and cooling areas.

More recently EPA launched the Energy Star computers program, which applies the basic principles of Green Lights -- engaging industry in a voluntary public-private partnership to maximize energy savings at a profit -- to personal computers, printers, and monitors. Energy Star-bearing computers could save enough electricity each year to power Vermont, New Hampshire, and Maine, cut electricity bills by $2 billion and reduce CO_2 pollution equivalent to emissions from 5 million autos.

Another successful EPA initiative is the 33/50 program, a voluntary pollution prevention program which called for reductions in high-priority toxic chemicals -- 33% by 1992 and 50% by 1995. I understand the interim goal was surpassed; chemical emissions have been reduced by almost 500 million pounds. These successes prove that government and the private sector working together can achieve impressive gains in cleaning the environment through voluntary measures.

Another EPA successful partnership approach is the Consensus and

Dispute Resolution Program, of which we are all justly proud. Starting in 1983 as a pilot project, this has now expanded to cover a wide range of rule-making efforts. It has been shown than rules developed through this process -- even when full consensus is not achieved -- are more innovative, pragmatic, environmentally effective, easier to implement and more readily adopted by industry. The EPA experience was the basis for the 1990 Regulation/Negotiation Act in 1990.

On the international level the Business Council on Sustainable Development, created originally to bring a business perspective to the Earth Summit, has emerged as a constructive private sector voice on policies and strategies to achieve eco-efficiency -- a term that covers reduction of energy use and reduction of pollution through prevention and recycling measures.

Question 2. How do each of you envision the role of the President's Sustainable Development Commission in U.S. environmental policy formulation?

Answer: The U.S., along with other countries at last year's Earth Summit, agreed to develop a national strategy for sustainable development. Several countries, notably Canada, Australia and the Netherlands, have undertaken large-scale public-private sector cooperative efforts to define sustainability in terms of their own social, economic and

environmental needs and to develop principles to guide their planning and regulatory processes.

The President's Council on Sustainable Development (PCSD) is charged with advising our government on its national strategy. With its broad-based membership from government, business, academia and environmental groups, the PCSD is in a unique position to bring different perspectives to bear on the formulation of national policy, particularly regarding efforts to apply the concept of sustainability to American economic-activity and social programs. Our challenge is to design a set of principles to guide public policy and business toward --- "broad based economic progress accomplished in a manner that protects and restores the quality of the natural environment, improves the quality of life for individuals, and broadens the prospects for future generations." (National Commission on Environment).

Question 3. How will the President's Sustainable Development Commission interact with the many federal agencies that carry out environmental policy?

Answer: The PCSD includes Department and Agency heads representing Agriculture, Commerce, Education, Energy, Interior, State and EPA. It is important that the sustainable development principles, guidelines and evaluation criteria developed by the PCSD through its Task Forces and demonstration projects be of

practical value to these officials and their staffs. Only by incorporating these ideas into Administration goal-setting processes and day to day management programs will we be able to see the practical results of the PCSD policy guidance.

Question 4. "Sustainable development" is a very catchy phrase. Unfortunately, it is difficult to succinctly define. Can each of you give several examples of development patterns that are not sustainable. What American practices do you feel exemplify unsustainability?

Answer: The most vivid illustrations of unsustainable lifestyles on a large scale are seen in the industrial pollution of Eastern Europe and the denuded landscapes of Haiti and Somalia. Ignoring the environment has cost these countries a large part of their economic base not to mention the incalculable cost of human suffering.

Fortunately in this country we took early steps to avoid massive pollution and to manage our natural resources. Although there are still many examples of degradation and potential loss of species, the U.S. has by and large built an infrastructure that allows us continued economic progress while improving the quality of our environment.

One of the greatest challenges we face on the path to long term

sustainability is the development of non-polluting, renewable energy sources. Although there have been impressive strides in energy efficiency, our current consumption of finite resources raises serious questions about the future supply. A serious R&D effort to produce alternatives to fossil fuel is key to sustainability throughout the world, including the U.S.

Sustainability also entails developing better ways to allow for growth and development while minimizing the destruction of habitats. Loss of habitat generally is harmful to bio-diversity -- one of the key concepts in achieving sustainable development.

TESTIMONY BY JONATHAN LASH, PRESIDENT, WORLD RESOURCES INSTITUTE; AND COCHAIRMAN, PRESIDENT'S COUNCIL ON SUSTAINABLE DEVELOPMENT

Mr. Chairman and Committee Members. I am Jonathan Lash, president of the World Resources Institute, a nonpartisan Washington-based policy research center working on global development, economic, and environmental issues. It is an honor to appear before you today to talk about the President's Council on Sustainable Development, which I cochair with my colleague, Dave Buzzelli, vice president and corporate director of Environment, Health & Safety and Public fairs for the Dow Chemical Company.

When President Clinton announced the Council on Sustainable Development at a Rose Garden Ceremony on June 15, he outlined our mandate—to help set policies to grow the economy and preserve the environment for our children and our children's children. By bringing together leaders from so many different sectors who are committed to finding ways to move our country toward a sustainable future, President Clinton has created a timely opportunity for us to develop a powerful vision of sustainability and a strategy to achieve it. In the process, we can change the way national environmental policy is made—from confrontation to partnership—from gridlock to progress.

The composition of the Council is very significant. It includes five members of the Cabinet as well as representatives from the conservation, civil rights, labor, and industrial communities. It's membership reflects a growing belief among business and environmental and community leaders that good economic policy protects the environment and good environmental policy strengthens the economy. The Council is the right group at the right time. Working together—and our first meeting is next Tuesday, July 20, here in Washington—we can define and recommend broad policy goals and strategies that can both strengthen the economy and protect the environment.

Environmental policy in the U.S. has evolved law by law and regulation by regulation. It has somewhat arbitrarily separated pollution of the air from that of land or water, and it has stressed clean up more than prevention. As a result, environmental programs sometimes conflict with one another. We have never defined a clear set of national environmental goals, or a coherent national strategy to achieve them. A consensus around a set of national goals would help to guide the process of policy reform to assure that we do not, as a colleague of mine put it, build fast trains to the wrong station.

The timing is right to bring diverse resources together as we stake out new directions. Many in the environmental and industrial communities agree that the next generation of environmental policy must achieve greater results and do so more cost effectively. From now on, our goal must be to prevent pollution at the start by motivating potential polluters to adopt new techniques and technologies.

Many recent efforts have affirmed the need to move in this direction through innovative, collaborative partnerships. We have just heard from Russ Train, who led the Train Commission—a group of corporate, environmental, and government leaders including four former EPA Administrators. Their report, *Choosing a Sustainable Future: The Report of the National Commission on the Environment*, concluded that the U.S. needs a new national strategy that fuses the goals of a healthy environment and a strong economy.

While the Train Commission was working, an international business forum, the Business Council for Sustainable Development (BCSD), was established at the request of the Secretary General of UNCED to provide business input to Earth Summit deliberations. BCSD concluded that "companies and governments must make ecological imperatives part of the market forces that govern production, investment, and trade".

Finally, the President's Commission on Environmental Quality (PCEQ), constituted under President Bush with representatives from government, industry and the environmental community, recommended a similar direction for the United States. PCEQ called for creation of a broad based Presidential Council that would encompass a cross-sectoral perspective not currently available. The new Council should help set priorities and develop policies to move the U.S. toward sustainable development and contribute to the national follow-up to the Earth Summit.

The President's Council on Sustainable Development is unique in the United States. But, worldwide, some eighty countries have established similar commissions since last summer's Earth Summit: All have been organized to develop national sustainable development plans consistent with national commitments made by world leaders in Rio. At least three countries have already concluded similar efforts. In his written testimony, Dave Buzzelli, vice president and corporate director of Envi-

ronment, Health & Safety and Public Affairs for the Dow Chemical Company, shared his experience with the first roundtable in the Western Hemisphere—the Canadian effort. Two additional national efforts are worth noting—the experiences of Australia and the Netherlands on sustainable development. Both contain important lessons from which the President's Council can benefit.

In 1990, Australia's Prime Minister and Cabinet officials established an Australian Roundtable on Ecologically Sustainable Development. Like the President's Council in the U.S., Australia's Roundtable was charged with developing a national strategy on ecologically sustainable development. The Roundtable included government, industry, academic, and environmental representatives. Al well, there were nine working groups for different sectors—from energy to manufacturing to forestry. Over two years, they developed recommendations that were presented in final form to the Prime Minister and the public as a National Strategy for Ecologically Sustainable Development.

The Australian roundtable's success was not accidental. The effort enjoyed significant commitments of staff and financial resources by the government. Forty workers from government agencies were seconded to staff the Roundtable. The government contributed sizable financial support—$800,000 alone was spent to enable the environmental community to participate. Strong involvement by the Prime Minister and Cabinet officials made the Roundtable visible, and gave members and working groups access to real power. In short, the Roundtable had the resources it needed to do a good job, and the involvement of the environmental community laid the groundwork for long term cooperation between industry and environmentalists. According to both the Australian Environment Minister and non-governmental participants, the process led to a changed political climate surrounding environmental policy and very significant reforms in some sectors.

At the same time, there were shortcomings. Despite government involvement during the process, not all of the recommendations have been implemented. Nor does the Australian government have the ability to mandate action by the states. It is important that the U.S. Council consider how recommended policies might be implemented. Our vision must be a practical one firmly connected to reality.

The Netherlands' experience is similar. It too was a serious effort with significant government commitments of financial resources. As a result of the process, the Netherlands also made government and business partners in environmental protection rather than adversaries.

The Netherlands National Environmental Policy Plan of 1989 (NEPP) was prepared by four government ministries as a coherent national strategy for achieving sustainable development in 25 years. According to a recent article by Hans van Zijst, counselor of health and environment at the Royal Netherlands Embassy in Washington, DC, in *Environmental Forum*, NEPP is a "breakthrough in environmental policy, with ecological quality becoming an integral component of the nation's economic strategy." NEPP encourages the creation of innovative economic and environmental instruments—like the covenant, a written agreement under Dutch civil law among one or more government bodies' and a well-defined group of companies—to put in place a long-range series of steps toward greater environmental performance for a specific industry.

The Netherlands' recognition that government cannot go it alone represents a dramatic turnaround. Before NEPP, government considered environmental protection its exclusive responsibility. NEPP states explicitly that all actors in the Dutch economy—agriculture, industry, power stations, households, and others—share this responsibility and must therefore help solve the nation's environmental problems. The Netherlands also recognized the critical importance of providing the substantial resources needed to implement the strategy. Some $15 billion has been set aside to implement the plan for the first five years (1990–94), divided more or less equally between government (general funds) and industry (direct costs). This sizable sum is on top of the existing level of environmental expenditure.

With both the successes and snags of these other countries' efforts in mind, I would like to take a minute to review the mission of PCSD and to give you my perspective on its future work and operating style. An attachment that accompanies my statement provides further detail.

First, the Council has been appointed by the President for a period of two years with the opportunity to extend its life for an additional two years.

The Council was established to—

- advise the President on both national and international sustainable development issues, and to
- develop and recommend to the President a national sustainable development strategy designed to help invigorate the economy and enhance the environment.

The Council is comprised of twenty-five highly committed and talented individuals, CEOs from private industry and environmental organizations, the Secretaries and Administrator of five federal government agencies, representatives from labor, state government etc. While we are limited to twenty five members, any number of individuals around the country will be involved in and asked to contribute to our effort. Dave and I are fully committed to seeking broad representation from all communities interested in sustainable development on any committees or task forces formed by the Council. We will instruct the PCSD staff to make sure that the Council hears the views from those "outside the Beltway." We will be persistent and innovative in searching for ways to involve the public in our debate over environmental goals and strategies. All the Council's meetings will be open to the public and advance notice will be appear in the *Federal Register*, among other channels.

In particular, Mr. Chairman, we are eager to hear from and involve Congress. Dave Buzzelli and I especially want to meet with members of Congress who have strong interest in and views on sustainable development and will try to arrange such meetings following the first Council meeting on July 20. Further, we are exploring offers of assistance by The Environmental and Energy Study Institute to organize and host dinner meetings with members of Congress and the Council on issues of mutual interest. Global Legislators Organization for a Balanced Environment (GLOBE) is also arranging luncheons to brief Congressional staff. We welcome the involvement of members of this and other Congressional committees and look forward to hearing members' views.

As I mentioned, the Council will meet for the first time on Tuesday, July 20 in Washington D.C. The attached agenda for that meeting shows, the primary objective is to begin discussing which issues the Council will address and which projects it will undertake, as well as how to structure work in these areas.

As the newly appointed president of the World Resources Institute, I am extraordinarily proud to report that for the past ten years WRI has been conducting policy research on the issues of poverty, sustainable development, natural resources, and environmental quality. Given the work of WRI and my own personal commitment to create a sea change in environmental and sustainable development policy in the United States, I was honored to be asked to co-chair the President's Council on Sustainable Development. I am committed to carrying out its mission—the preparation of a recommended sustainable development action strategy for the U.S. I believe we will succeed and can think of no greater opportunity to help the country and the world.

PRESIDENT'S COUNCIL ON
SUSTAINABLE DEVELOPMENT

TUESDAY, JULY 20, 1993—9:00 AM-3:00 PM
THOMAS L. KIMBALL CONFERENCE CENTER
1400 16TH STREET, NW, WASHINGTON, D.C.

9:00 AM	Welcome	Vice President Gore (invited)
9:30 AM	Opening Comments	D. Buzzelli J. Lash
9:45 AM	Discuss Charter, Time Line and Funding	J. Lash D. Buzzelli
10:15 AM	The Work Process of the PCSD	D. Buzzelli J. Lash
11:00 AM	Response to Questions Submitted by the Public	D. Buzzelli J. Lash
11:15 AM	Developing a Preliminary Work Plan of the PCSD: A Facilitated Roundtable Discussion	J. Lash D. Buzzelli J. Ehrmann
12:30 PM	Adjourn Meeting for Lunch	
1:30 PM	Selection of Initial Tasks and Work Assignments	J. Lash D. Buzzelli J. Ehrmann
2:15 PM	Wrap Up: • Future Meeting Dates • October Agenda • Feedback on Members' Perception of First Meeting	D. Buzzelli J. Lash
2:40 PM	Public Comment	J. Lash D. Buzzelli
3:00 PM	Adjourn	

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PRESIDENT'S COUNCIL ON
SUSTAINABLE DEVELOPMENT

September 15, 1993

The Honorable Max Baucus
United States Senate
Washington, DC 20510

Dear Senator Baucus:

In response to your question regarding the sustainable development hearings, we have not studied nor has the President's Council on Sustainable Development discussed the Environmental Justice Act. In order to ensure that we do not address too many concerns simultaneously which would result in both the expenditures of money and effort without positive environmental impact, we need to ensure resources are deployed on the most critical issues first. The efforts of the President's Council will probably be directed at the process we employ for setting priorities and examining broad areas for prioritization.

Our next meeting will include a discussion on environmental justice. Reverend Chavis is a member of the Council, and his leadership on the environmental justice issue will help us in scoping this issue and determining whether the Council can make a unique contribution.

The role of the Council is to provide in two years a strategy recommendation on sustainable development to the President. The process will entail utilizing not only the expertise of 25 members from a cross section of the public and private sectors but will also seek out non-members in an attempt to obtain as much in the way of current examples of sustainable development as well as new ideas for allowing economic growth without adversely affecting the environment.

We understand that Congress will be important as the President's Council proceeds to implement the action strategy that will foster economic viability. Although the meetings of the Council are public, we plan on arranging with you and other members private meetings to share our ideas and seek your thoughts.

Although the 25 members of the President's Council do not include congressional membership, please be assured we intend to fully involve members and staff. To date, Council liaisons have had four congressional briefings including one with GLOBE (Global Legislators Organization for a Balanced Environment) and are committed to meet with members and staff who have expressed interest in sustainable development. EESI (Environmental and Energy Study Institute) has offered to host small dinner meetings with members.

Sincerely,

David T. Buzzelli
Co-chair

Jonathan Lash
Co-chair

ejp

ADDITIONAL QUESTIONS FOR ALL THE WITNESSES
FROM SENATOR BAUCUS

The Environmental Justice Act that I introduced in June could have easily been called the "Setting Priorities Act." It requires the EPA to list the most toxic 100 communities, and then to act quickly in any of those communities where pollution poses a significant health risk.

In your testimony, you recommended that we set priorities when writing and rewriting environmental laws. I would appreciate your evaluation of this very focused effort to set priorities that cut across environmental media.

In addition, I would appreciate your insight in the consideration given to the possibility that poor areas might become environmental as well as economic ghettos. In drafting some of the landmark environmental laws, was this likelihood foreseen? Will laws such as the Community Right-to-Know Act and the proposed Environmental Justice Act help us avoid this outcome in the future?

From Senator Barbara Boxer

Questions to Mr. Lash and Mr. Buzzelli; Co-Chairs of Pres. Commission

1) Can either of you explain why the President's Sustainability Commission does not include members of Congress?

2) How do each of you envision the role of the President's Sustainable Development Commission in U.S. environmental policy formulation?

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